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Universal Apprenticeship Essential

Shortage of Skilled Mechanics Cannot Be Overcome So Long as Common Duty of Training Younger Generation Is Shirked

BY HAROLD S. FALK*

THE man who works is the most important factor in the industrial world. An abandoned factory, with crumbling walls, sagging roof, windows broken and doors off the hinges, is excellent evidence that industry without men is worse than useless. Up-to-date equipment, efficient accounting systems, strong financial foundation, advantageous location, loyal and satisfied customers—all these are futile without a strong organization of men who know their work.

Manufacturers and business people have gradually come to realize this important fact and are devoting more and more thought to matters of personnel. Business men who are confronted with more problems than they can take care of have asked themselves why they should not train assistants to help them with these problems. This thought naturally enough suggested another—that if an organization is efficient, it will not present so many problems in the first place, and in the second place will include a great number of men, even in subordinate positions, who can solve their own problems long before they reach the head of the business.

General Lack of Interest in Apprenticeship

Accordingly, there has grown up in the last few years a very considerable development of personnel work in industry. Employment departments have been set up for careful and sometimes scientific selection of workers; the work and habits of men are analyzed and recorded to find for each one the task for which he is best fitted; shop committees have been appointed for safety, for the adjustment of disputes, for improvement in processes and for other purposes; insurance and pension features have been provided; hospitals have been established; working conditions have been improved; training courses for young engineers, for salesmen, for foremen and for office workers, as well as other educational advantages, are available in many industries.

It is a curious fact that in spite of all this there is a general lack of interest in apprentice training among American business men. Of course, there are exceptions. Here and there may be found organizations, especially among the railroads, in the machinery building industry

PATTERN Apprenticeship Is the Oldest Branch of Apprentice Training in the Falk Shop and None Is Better Organized

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and in the building trades, in which thorough programs of apprentice training have been arranged. However, the great majority of our employers seem to think that all necessary men can be hired when needed, or they do not think about the matter at all.

Prevalent Opinion that Modern Mechanical Industry Requires No Skill

Some time ago I spoke before a group of foundrymen on the subject of apprentice training. During the informal discussion that followed the talk, one of the foundry operators stated that his plant was on a production basis and that all his castings were made on molding machines which were automatic and practically fool-proof. He stated that modern machinery dispenses with skilled mechanics, that he had no need for them in his plant and did not want any. This is merely an example of the far

FOUNDRY Apprentices and Certain Machine Shop Apprentices Are Given Several Months' Training in a Heat-Treating Shop, Not with the Idea of Making Them Skilled in Heat Treating Steel, but to Teach Them to Appreciate What May Be Done in Changing the Properties and Characteristics of Steel

too prevalent opinion that trained men are not required in modern mechanical manufacturing.

The following answer to the argument is from an article which recently appeared in a well-known trade publication:

"Managers of automobile plants have been known to say that they want nothing except men who can be taught a mechanical operation and are willing to stay at it indefinitely. But where do such managers obtain their superintendents, their foremen and inspectors? Who is there to show the mechanical operators what to do and how they are to do it? Mechanics are necessary in production industries to take care of the maintenance of machinery and to set it up in the first place. Skilled men of the highest class are required to plan and to make the tools and fixtures that make production work possible. Only highly trained men can plan the routing of work. the placing of machines and the proper arrangement and correlation of various departments."

It may be true that the proportion of skilled mechanics required in mass production is smaller than in the old-fashioned manufacturing methods, but the production industries have expanded so much that the actual number of mechanics required is probably greater than ever before.

Moreover, it must not be forgotten that there are important and extensive industries that do not readily lend themselves to mass production methods. For instance, we do not expect to find any considerable number of unskilled men on line assembly and machine operations in the manufacture of locomotives, passenger cars, boilers and turbines for public service corporations, furnaces, cars and rolls for the steel industry, printing presses, machinery for vessels, equipment for food and chemical industries and water turbines. Such products will continue for years to be built as individual units rather than by thousands along an assembly line and, hence, in those industries, the all around mechanic will continue to hold his own.

Shortage of Apprentices in the United States

Magnus W. Alexander, president of the National Industrial Conference Board, explained the situation excellently in a paper before the American Society of Mechanical Engineers in December, 1924. That is some years past, but conditions have not changed materially since then. According to investigations made by his organization, about 5 per cent of the industrial workers in the United States must be replaced every year. Since the ordinary apprentice training course extends over a period of several years, 15 to 20 per cent of the total number of skilled mechanics should be constantly in training as apprentices in order to supply the required 5 per cent every year. He placed the number of skilled mechanics in the United States at 4,500,000. Fifteen to 20 per cent of this number would be from 675,000 to 900,000 apprentices. As a matter of fact, only 144,000 apprentices were reported in the United States at the time his paper was presented. Accordingly, there was at that time a shortage of over half a million apprentices in the country, indicating a pronounced shirking of the duty of training mechanics on the part of American business people in general.

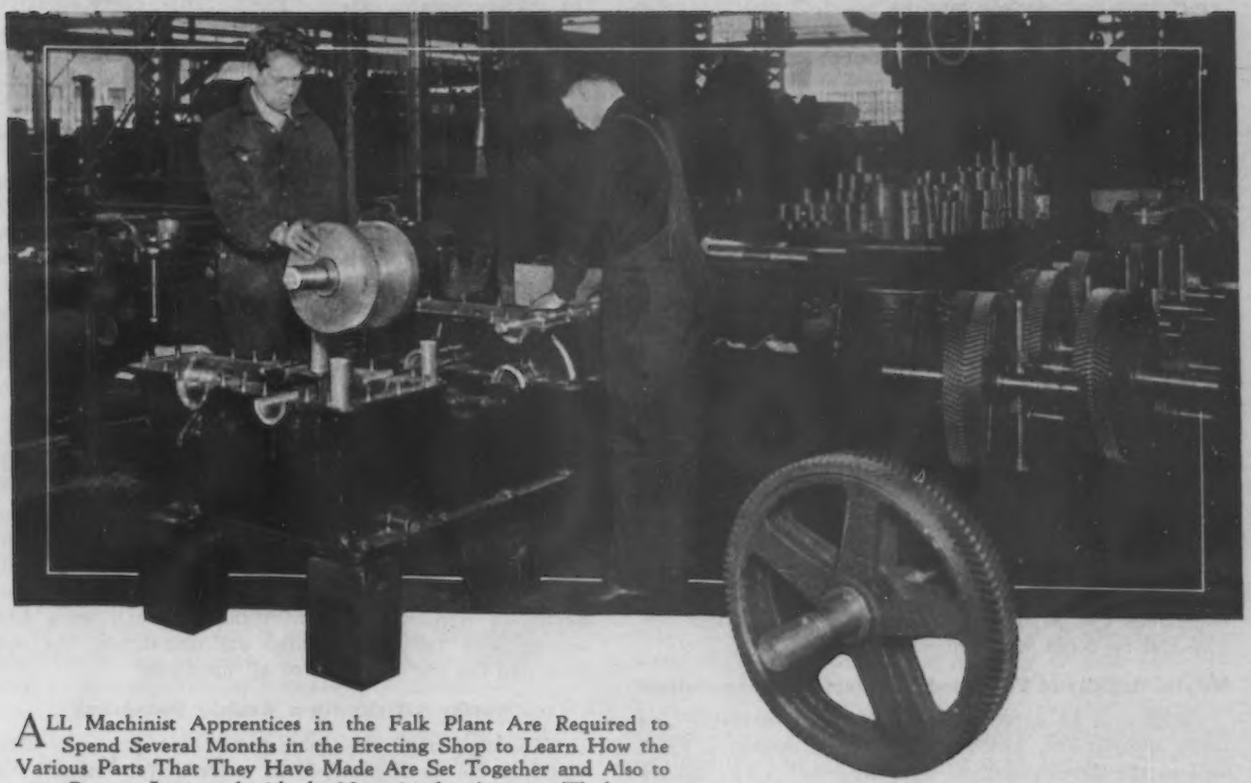
Apprentice Training Not a Financial Burden

Apprentice training will not be an added financial burden upon the manufacturer, if carefully established and if the quota of apprentices is correct. It has been shown by experience that the work of apprentices is done well enough to carry not only the labor cost but all indirect charges caused by apprenticeship administration and supervision as well. However, apprenticeship is no longer a paying enterprise if the quota of apprentices is too high.

For this reason the present conditions are unfair to those few manufacturers who train apprentices. They find that a very considerable portion of the apprentice graduates leave as soon as their course is completed. This proportion is sometimes as high as 50 per cent. Accordingly these companies are forced to maintain up to double the correct quota of apprentices in order to supply their own requirements in skilled men.

Industry Needs Universal Apprenticeship

There are reasons other than the unfairness of the present methods why apprenticeship should be extended to every industrial district and to practically every manufacturer. Industry's need for trained men will not be satisfied until this is done. Although certain manufacturers now train many more apprentices than they themselves need, it is utterly impossible for them to train all that are required, even if they were willing to do so. The shortage of half a million apprentices in the country which was pointed out by Mr. Alexander cannot be made up until apprenticeship becomes universal. Apprenticeship should be made a community responsibility in every manufacturing district. Employers in each district should



ALL Machinist Apprentices in the Falk Plant Are Required to Spend Several Months in the Erecting Shop to Learn How the Various Parts That They Have Made Are Set Together and Also to Become Impressed with the Necessity for Accurate Work

associate themselves for the purpose of supplying together the number of skilled mechanics required in the district.

How universal apprenticeship is to be achieved is another matter. Apprenticeship will not grow of itself. It is comparatively easy to point out the need for it and extremely difficult to devise a way of bringing it about. However, intensification of efforts already begun will go a long way.

Promotion by Interested Employers

Employers who are training apprentices can accomplish much. Economists, engineers, employment experts, Federal and State agencies, educational authorities—all these can preach the need of apprenticeship to a manufacturer and he will pay little attention to them. But when another manufacturer, one of his own class, one who is confronted by the same problems and difficulties, tells him that apprenticeship is necessary and that he has made a success of it, the skeptical manufacturer becomes interested.

Therefore, manufacturers who employ apprentices will do well to call the attention of their associates constantly to the advantages of apprentice training: The strong corps of young mechanics who will be effective for years to come; a stable organization, sympathetic with the policies of the employer; a group of young men from whom

FALK Corporation Apprentices Have an Association That Sponsors Entertainments and Athletic Events. The meeting depicted shows part of the association organizing for an annual picnic

executives and officials may be selected, and the desirability of a force of mechanics who are not only skilled in their trades but thoroughly acquainted with products in addition.

In the Milwaukee branch of the National Metal Trades Association much has been accomplished in this direction by a number of well-organized committees on apprenticeship. By standardized supervision and procedure and a program of promotion they have doubled the number of apprentices in the district in the last 10 years. Trade skill contests, banquets for apprentices and for foremen and superintendents, and contact with the schools have played an important part in this work.

Wide Publicity Essential

In addition, the development of apprentice training can be greatly assisted by general and constant publicity. This should be directed not only toward business men, but also toward the general public, associations of various kinds, civic bodies and, especially, school teachers and school authorities. It has frequently been pointed out that no program of apprentice training will be successful that is not built upon the approval of the community.

In this matter of publicity, the trade and business magazines and papers have performed an excellent service and no doubt will continue to do so.

Helpful Activity of Trade and Manufacturing Associations

Much can be expected from the manufacturing and trade associations, which have also contributed a great deal to the development of apprenticeship. The officers and professional managers of these associations have, as a rule, shown more foresight and appreciation of the advantages of apprenticeship than have the members themselves. This was to be expected. The individual member of an association is more or less absorbed by the activities of his own plant and business. He is seldom in a position to appreciate difficulties of a general nature unless they concern him directly.

On the other hand, officers and managers of associations can survey the entire industry that they serve, and their investigations frequently disclose the existence of problems that must be solved by the industry as a whole, even though they may not oppress any individual member to any appreciable extent. For instance, every employer who is a member of an association may hire salesmen and foremen as he needs them and think nothing of it. However, the manager of the association understands that members are merely taking these salesmen and foremen from each other, creating a high turnover and increasing the cost of doing business for all.

A number of associations have appointed training directors and have made considerable appropriations for their work. The directors visit the members, help them in organizing apprentice training programs and make efforts to interest those who have not begun the work. Associations have also made discussion of apprenticeship problems a part of their regular meetings, have issued booklets and circular letters on the subject and have given to the movement the support of their boards of directors.

In addition, certain associations have made a careful study of the problems of apprenticeship and have prepared solutions for their membership when possible. Thus, they have arranged and published courses of work for various trades, standard forms for contracts, certificates and records, have established bureaus of information, have made calculations of the needs of their membership for mechanics and have worked out theoretical minimum quotas of apprentices. Unfortunately, such work has seldom been fully appreciated and sometimes has not even had the full approval of all members.

Worthy Activity for a Wealthy Foundation

The suggestion has been made that apprenticeship would be an excellent field of activity for one of the wealthy foundations. The mere fact that such an institution took up the study of apprenticeship would give a great impetus to the movement.

The development of apprentice training so far has been due almost exclusively to the efforts of the various agencies that have been described and, undoubtedly, they will achieve still greater results. If more people can be attracted to these activities and can be made to take an interest in them, a much greater extension of the movement during the next few years may be expected. Other and better plans may easily come to the minds of those who apply themselves to the study of universal apprenticeship, a problem that must be solved.

Germans Study Energy Losses in Heroult Furnaces

TWO articles have appeared in the German technical paper, *Archiv für das Eisenhüttenwesen*, discussing energy losses in Heroult electric furnaces.

The first article discussed losses in a 7-ton furnace with particular reference to heat accumulation processes. N. Wark was the author. With the intention of determining the distribution of the energy losses between the transformer, the current leads, the cooling water, the furnace body and the furnace gases, it was found that time of charging, the quality of the scrap and the condition of the furnace refractory walls in particular, have an influence on the heat losses of the furnace. The flow of heat through the furnace walls was investigated, and it was ascertained that the amount of the accumulated heat decreased during the melting period, as the heat supplied to the walls was insufficient to make up for that which was radiated externally

In the other article, written by H. Klinar, O. Reinhold and N. Wark, losses in a 15-ton furnace with particular reference to the wear of the roof were discussed. Energy balance sheets were prepared for the life of one roof from the data obtained during four melts, using cold charges. These showed clearly the dependence of the heat losses on the wear of the roof.

As regards the ability of the roof material to absorb heat, the results which were obtained confirmed those recorded with the 7-ton furnace, referred to above. The thermal balance sheets of melts made with liquid charges showed that the energy supplied was almost entirely used up in the formation of the slag and in making up the radiation losses.

These abstracts were made by the Iron and Steel Institute and the National Federation of Iron and Steel Manufacturers of London, England.

"The Thermal Expansion of Tantalum" is the title of research paper No. 62 of the United States Bureau of Standards. It is a reprint from the bureau's *Journal of Research* and the author is Peter Hidnert. It contains 10 pages and is illustrated with charts.

Foundry Uses Hot-Blast Cupolas

Marked Savings in Fuel and Time—Borings Made into Briquettes for Charge—Mixing Ladle to Be Used

BY FRED L. PRENTISS*

BY adopting improved production, materials-handling and other methods, and by providing better arranged foundries and more efficient equipment, the automotive industry has played an important part in the last few years in the development of the foundry industry. These changes have resulted in the reduction of hand labor to a minimum, better working conditions for the men, lower production costs and improvement in the quality of the product.

When a new foundry is built to make motor car castings, the builder attempts to improve on the last one and thus to assure a further increase in efficiency and reduction in the cost of making castings. The latest foundry to be built for the manufacture of motor car castings is the gray iron unit of the Oakland Motor Car Co., Pontiac, Mich. Its numerous interesting features in layout, arrangement, handling and other equipment, foundry practice, elimination of hand and hard labor make it an outstanding plant in the foundry field. Well lighted and well ventilated buildings make working conditions excellent.

Preheated Blast Used for Two Cupolas

From a production standpoint one of the most interesting features is the use of hot-blast cupolas, the blast of two of the four cupolas being preheated by the combustion gases from the cupola, resulting in a greater output and a saving in fuel. This is the first automobile foundry to use the hot-blast method with its cupolas, although the Griffin Wheel Co. has been using hot-blast cupolas for some time.

A new method of handling the cupola charging material and making up the charges is designed as an improvement over methods employed in other modern production foundries which have largely eliminated hand labor in the charging of cupolas. One of the interesting features of this part of the foundry is that cast iron borings are made into briquettes for the cupolas. The equipment for handling the borings and the briquettes themselves is all a part of the cupola materials-handling system, working in conjunction with the equipment for handling pig iron and scrap.

Methods provided for delivering castings and sand from the shake-out to the basement, removing them immediately from the foundry floor and keeping the foundry largely free from the heat, smoke and gases that come from the molds and castings, are recent developments which tend to improve working conditions in the foundry.

Built for making practically all castings for the Oakland and Pontiac cars, the foundry has a rated melting capacity of 450 tons a day. The buildings are arranged for convenience in handling material and castings, the whole plant being laid out to avoid counterflow of work.

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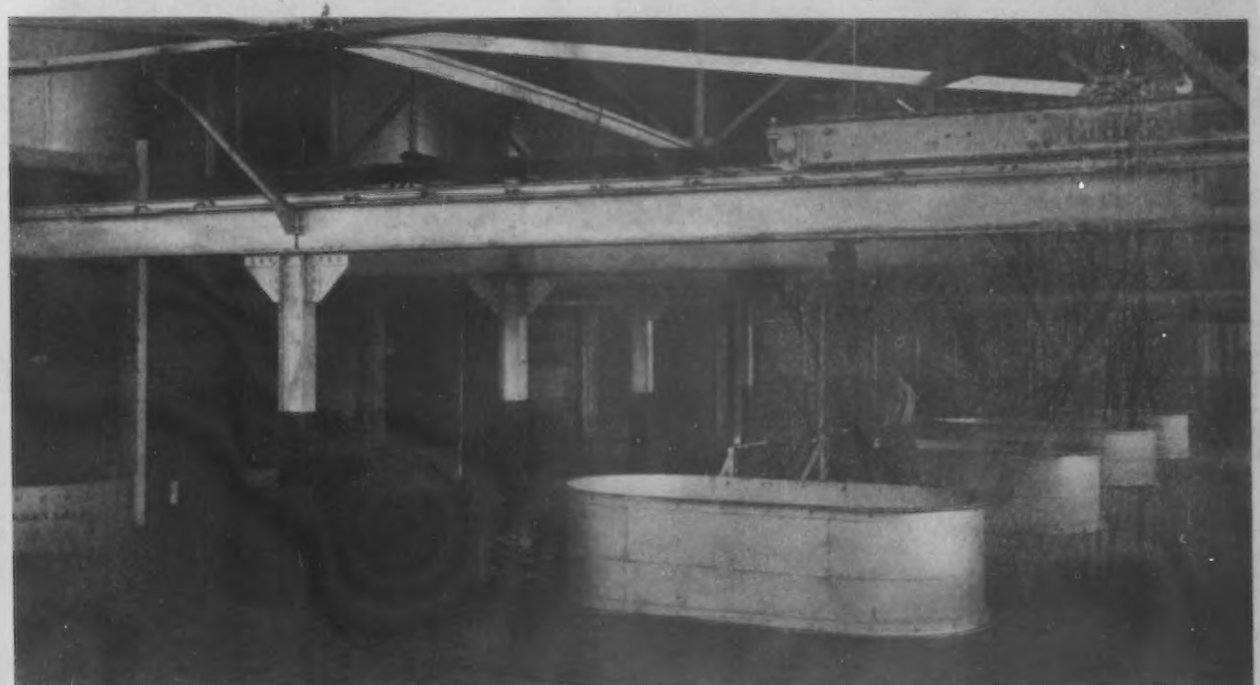


Cupola Charging Floor. Charges are brought up by the cupola charger from the ground floor through the shafts shown

Four tracks coming in from one side feed the plant. Two of these are for sand and two for fuel and metal. A fifth track serves a conveniently located service building, running along a dock at the side of that building for delivering flasks, wire, machinery and miscellaneous supplies to the maintenance department, stock room and wire room.

Finished castings, on leaving the cleaning department, move to the adjoining shipping department and from the loading dock at the side of that department are carried by truck to the adjoining motor building. Service yards of ample size are provided between the foundry buildings.

All four cupolas have 90-in. shells, lined down to about 60 in. Gases of combustion are drawn from the hot-blast cupola into a gas chamber through 16 openings 5 ft. below the charging door, by a suction fan using ½-oz. suction. The gas, mainly carbon monoxide, is delivered to the combustion chamber of one blast heater that serves the two cupolas. Cold air for the cupola blast is delivered by the cupola blowers into the blast heater and, after preheating by the burning of the cupola gases, enters the cupola at a pressure of 8 oz. at a temperature of 400 deg. Fahr. That temperature is closely maintained at all times. The volume of preheated air entering each cupola is controlled by a Bacharach indicator and recorder.

Blast for the four cupolas is supplied through one feed line by three Root blowers, two driven by a constant-speed and one by a variable-speed motor. As low pressure is used on the hot-blast cupolas, the full capacity of the three blowers is not required. For this reason the volume of air is regulated by the use of one variable-speed motor.

A Measure of the Improvement in Performance

Melting capacity of the cupolas has been materially increased by the use of the hot blast. The output of each hot-blast cupola is 19 to 20 tons an hour, compared with 15 to 16 tons an hour on the cold-blast cupolas with the same linings. Coke consumption has been reduced to one ton for 10 tons of iron melted, compared with a ratio of 1 to 7 in the cold-blast cupola. The sulphur content of iron melted in the hot-blast cupola is considerably lower than that made in the cold-blast cupola. Another advantage claimed for the hot-blast method is that it preserves the furnace linings.

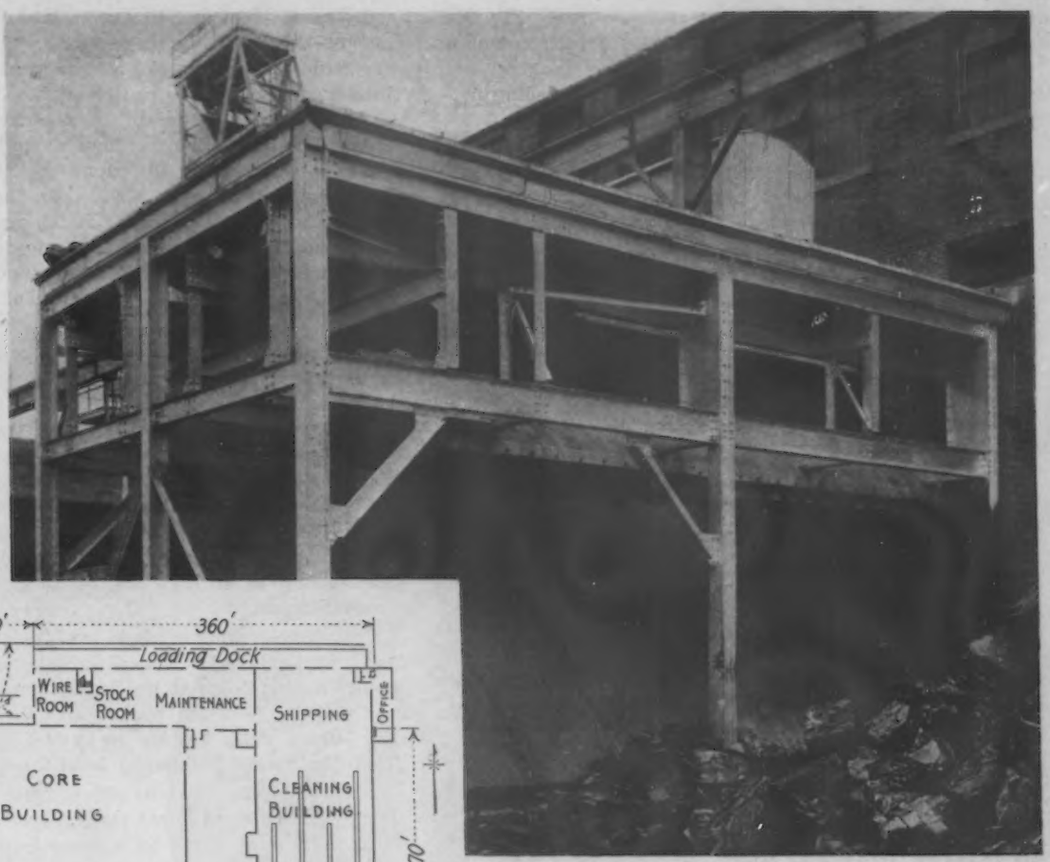
For making iron for all kinds of castings the cupola charge is 4000 lb., of which approximately 46 per cent is malleable pig iron, 5 per cent nickel-chrome iron, 35 per cent cast scrap and the remainder steel scrap. Cylinder blocks and heads are made of hard iron. Iron for flywheels and clutch plates at present is softened by the addition of ferrosilicon in the ladle. With the completion of all the molding units, both hard and soft iron will be made, the latter to be used for the smaller parts. These will include transmission housings, intake and exhaust manifolds, clutch plate housings and miscellaneous small castings.

HANDLING Equipment in Weighing Room, the Stockyard Being at the Left, Outside the Building. Weighed material drops into the charging buckets as they are pushed along the rollers at rear. The briquette hopper is shown at top

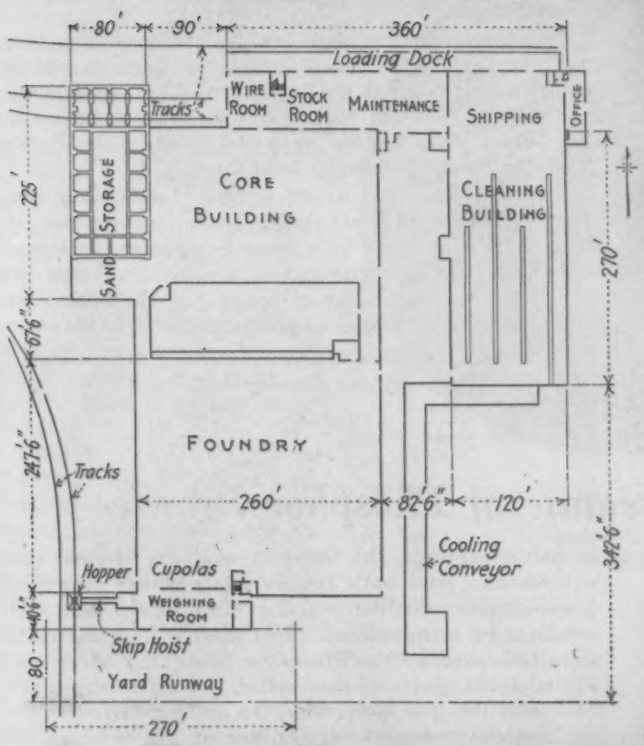
LIFT Truck Picks Up Charging Bucket by Cone Head on a Shaft Extending Through Center of Bucket, and Carries It by a Slot in the Truck Frame

Metal from the four cupola spouts will flow into a 4-ton mixing ladle, to be installed shortly, to secure a more uniform metal. This ladle, of the tilting type mounted on an electric truck, will deliver the iron to the Sprague hot-metal carrier now in use. This has a 2000-lb. ladle in which metal is taken to the pouring bays, where it is delivered to the pouring ladles.

Four short, horizontal conveyors carry metal from the stockyard through openings in the side wall to the weighing room, at the side of the cupola building, in which the charges are made up. One conveyor handles



ONE of the Conveyors for Delivering Scrap from the Stockyard to a Bin in the Weighing Room (Right)



LAYOUT of the Foundry Departments, Showing How Iron and Cores Move from Either Side to the Molding and Pouring Floors. Thence the castings proceed toward the right, to the outside cooling conveyor, which, in turn, deposits them in the cleaning room

CHARGING Bucket Setting on a Scale to Receive Its Charge of Coke and Limestone from the Hopper Above (Right)

steel scrap, one cast scrap and two pig iron. Pig iron and scrap are placed on the conveyors by the traveling stockyard crane, equipped with a lifting magnet, and from each conveyor the metal drops into a weighing hopper of about 1-ton capacity.

There is a weighing hopper for each conveyor and a fifth for briquettes. The metal is dropped from the weighing hopper to a charging bucket of 4000-lb. capacity set on a roller conveyor located at floor level. This conveyor extends along the side wall of the weighing room, directly beneath the hoppers. The empty charging bucket is spotted by a specially designed electric lift truck under the first hopper and, after the charge is received from this hopper, the bucket is pushed forward on the roller conveyor by an air-operated mechanism that moves the bucket a fixed distance—to a point beneath the second hopper—to receive the second portion of its charge, and so on until the charge is made up. Charges are placed in the bucket in this order: Steel scrap, waste scrap, briquettes, two kinds of pig iron.

The charging truck picks up the loaded bucket at the end of the roller conveyor and sets it beneath a hoisting shaft that connects with the cupola charging floor above.

Borings are brought in open-top cars from the motor plant to the stockyard and unloaded with the stockyard crane, which places the scrap into two storage bins, each of 50-ton capacity. A single belt conveyor carries the scrap from these bins to a Southwark briquetting machine in which they are made into cylindrical briquettes 4 in. in diameter and 4 in. long, weighing about 8 lb. each. The briquettes are discharged into an elevator which carries them to a horizontal conveyor above the weighing room. From this they fall into two 50-ton storage bins located above the roller track on which the charges are made up. From these bins the briquettes are discharged into a weigh hopper located in a line with the other hoppers used in making up the charges.

Coke and limestone are dumped from hopper-bottom cars into the hopper of an automatic skip hoist, which delivers the fuel and limestone into a storage bin at the end of the weighing room. This bin, having a capacity for four carloads of coke and one of limestone, is divided into five sections, the center section being for limestone and the others for coke. Coke and limestone are discharged from the bin through a hopper into a charging bucket—800 to 1000 lb. capacity—set on a scale. The discharge gate of each bin section can be operated independently. The bucket with its charge of coke and limestone, 60 lb. of the latter per ton of metal, is taken by the charging truck to the hoisting shaft. Coke breeze and fine coke pass through a screen that leads to a storage tank.

An interesting feature of the coke-charging equipment is the design of the charging buckets. These have a steel shaft through the center, on the upper end of which, extending slightly above the top of the bucket, is a cone-type button which is used for handling the bucket. The charging truck designed to operate the bucket picks up the bucket by the button. The cupola charging machine which elevates the bucket to the charging floor also lifts the bucket by gripping the button end of the shaft. The buckets are 48 in. high and 54 in. in diameter, and have dump bottoms.

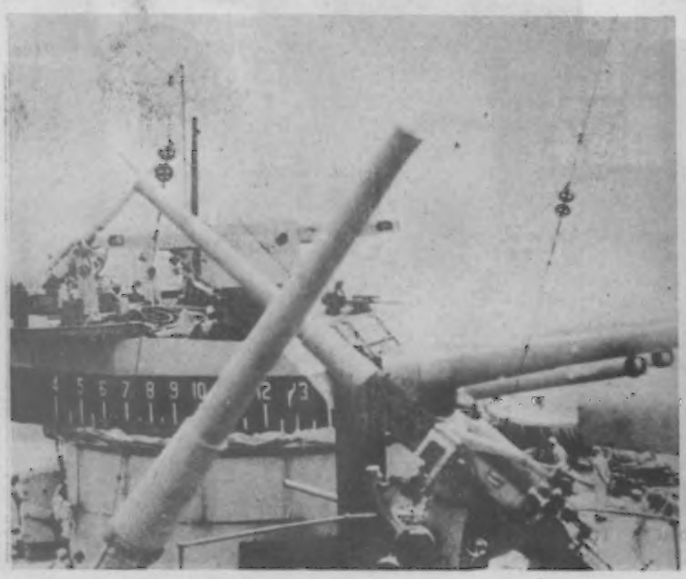
As the elevating shaft is oval in form, providing room for two buckets, a loaded bucket can pass up and an empty bucket down at the same time. The cupola charging machine sets the bucket into the cupola, flanges on the bucket sides resting on a wishbone in the cupola. Then the bucket is dumped from the bottom.

This charging machine differs from those used in some foundries in that it is not provided with an operating cab. Instead, it is operated by a control switch at the side of the cupola, and only one man is required to charge two cupolas. He controls the movements of the bucket and charging by simply stepping from one switch to the other.

[A second article will follow, describing the molding, pouring and cleaning facilities.]

Gears and Wireless Antennae of Phosphor Bronze

TWO bureaus of the United States Navy make large use of gears: the Bureau of Ordnance, in charge of guns and torpedo tubes, and the Bureau of Engineering, of the power supply and all auxiliaries, such as deck and hoisting engines. Both bureaus are wide users of phosphor bronze gears, the former in gun mountings, the latter in auxiliary engines and equipment. And both specify gears which show best possibilities in civilian practice; they desire that such products be standardized. In the two pictures, which were furnished by the Phosphor Bronze Smelting Co., Philadelphia, gears of that metal, hidden in the winch and the gun mountings, do not appear. But the wireless antennae shown are of the same metal.

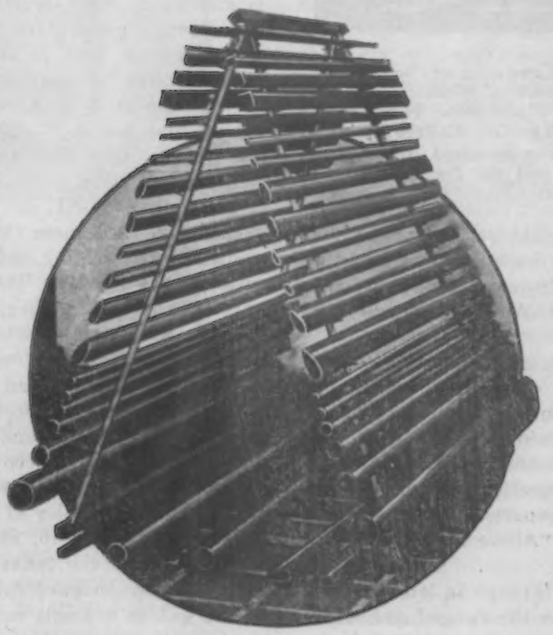


Metals Used in Airplane Making

Increasing Volumes of Chrome-Molybdenum, Nickel and High-Carbon Steels and Aluminum Alloys

BY GEORGE S. HERRICK

SINCE the memorable flight in a heavier-than-air machine by Orville Wright at Kitty Hawk, N. C., Dec. 17, 1903, not only the materials but the designs of aircraft construction have been changed radically. The box-like craft of bamboo, ash or balsa wood and cloth, with ordinary steel wires for the flying and landing braces of the wings, has rapidly developed into the modern craft of rakish lines and metal construction. Each step in the progress has found metal coming into increasing importance, until the airplane has become the incentive to the rather intensive development of both steel and non-ferrous alloys, all competing for a permanent and efficient place in aircraft manufacture.



THESE Tubes, Round, Square and Streamline in Various Sizes, Are All Used in the Construction of Aircraft. The display is of tubes made by the Summerill Tubing Co., Bridgeport, Pa.

Almost over night the American end of the airplane industry became a real factor among our manufacturing enterprises, and while Europe, as in the development of the motor car, continues, of course, to be a builder of airplanes, America is in the throes of an activity which is approaching the mass production basis that is characteristic of modern industries in this country.

It is estimated that about 60 companies are constructing almost 95 per cent of all the airplanes produced in this country at the present time. Of these, about eight are leaders in building the large, all-metal, passenger carrying types.

Of the total output, probably about 90 per cent of the planes are fabric covered over alloy steel frames, with a few of alloy aluminum frames, leaving about 10 per cent covered with aluminum alloy sheets. Magnesium still is preferred by some makers for certain parts. Aluminum foil still finds use to cover the wood frame, or metal parts, to protect them against rotting or corrosion from contact with the textile covering, which has been treated with an acetate "dope."

Chrome-Molybdenum Steel Most Used

Except for certain builders who are using fuselage frames of 17-ST aluminum alloy in the form of structural shapes or tubing, chrome-molybdenum steel tubing is preferred. Those who have European experience cling to a medium-carbon seamless steel tube. It was the ordinary seamless tube which succeeded the fuselage of wood and is still used by many British and Continental builders. This tubing, listed in Army and Navy specifications as No. 57-180-1A, has an analysis of C, 0.20 to 0.30 per cent, Mn, 0.50 to 0.80 per cent, P, 0.045 per cent maximum and S, 0.050 per cent maximum. Its physical properties are a minimum strength of 55,000 lb. per sq. in. and yield point of 36,000 lb.

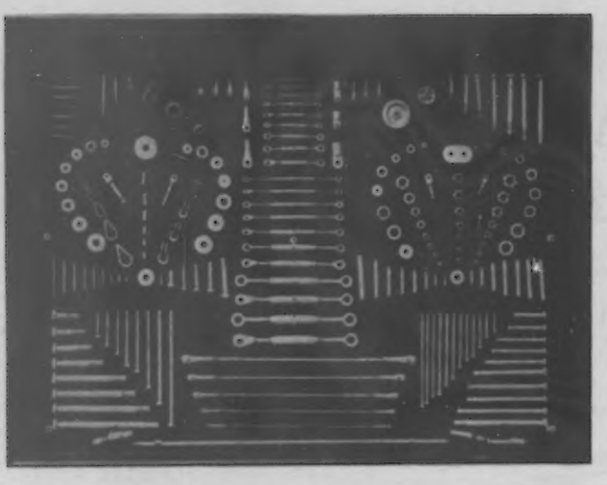
By far the greater number of American builders today are using chrome-molybdenum steel tubing classified in the Army and Navy specifications as No. 57-180-2A and with a standard analysis of C, 0.25 to 0.35; Mn, 0.40 to 0.60; P, 0.04 max., S, 0.045 max., Cr, 0.80 to 1.10 and Mo, 0.15 to 0.25. This is the same analysis as S. A. E. No. 4130 X. Most of it is of the seamless manufacture, streamlined (ovate section) in exterior positions, where air resistance must be at a minimum.

The round chrome-molybdenum tubing used ranges in size from ¼-in. outside diameter and 0.028 in. in wall thickness and 7/16-in. O. D. with 1/32-in. wall to 2½-in. with ¼-in. wall. In certain of the large passenger carrying ships, tubing as large as 3½-in. O. D. with ½-in. wall is used, usually only for a small section for an axle or for part of the frame of the landing gear.

The smallest diameters of tubing are used in high-speed planes for forming the frame of the tail and after section of the fuselage, the larger diameters going into the main section and the undercarriage. Certain makers use a limited amount of square tubing for the frame around the cockpit, as they claim that the square tube offers greater resistance to squeezing, tending to afford great protection to the occupant of the cockpit in the event of a serious accident.

Streamline tubing goes into such parts as the undercarriage and struts of the wings, where motion through the air will be attended with a minimum of eddies. These streamlined tubes are drawn in all the required sizes and vary somewhat in shape, as may be seen in the accompanying illustration of a sample stand at the Summerill Tubing Co., Bridgeport, Pa.

The quantity of tubing used in an individual plane ranges from 350 ft. in a small open cockpit, single place plane to possibly 1000 ft. in an open cockpit two place plane, about 1400 ft. in an inclosed cockpit design, 1600 ft. or more in a large passenger carrying plane, such as the "Patrician" recently built by the Keystone Aircraft



THESE Products for Aircraft, Consisting of Bolts, Tie Rod Terminals, Turnbuckles, Shackles, Washers, Grommets, Thimbles, Pulleys, Ferrules, Clevis Pins, Nuts, Are Produced by the Aero Supply Mfg. Co., College Point, L. I., or Its Subsidiary Companies, the Standard Automatic Products Corporation, Corry, Pa., and the National Steel Products Co., Dayton, Ohio

Corporation, Bristol, Pa., and as much as 3000 ft. in a large, 30-passenger ship, recently constructed by the Fokker Aircraft Corporation of America, Hasbrouck Heights, N. J.

Makers of tubing for aircraft, as do manufacturers of other materials entering into airplane construction, apply rigid standards of inspection. In the plant of the Aero Supply Mfg. Co., College Point, N. Y., is prominently displayed the advice to workmen, "Make It Safe for the Flyers," and in the inspection department of the Summerill Tubing Co., Bridgeport, Pa., is a large sign with the advice to inspectors, "Above All Be Careful. You'll Fly Yourself Some Day."

In this latter mill, tubes travel through in lots, usually consisting of a single order. When the swaged end, used for drawing the tubes through the dies, is sawed off, each tube is permanently numbered on the end and after passing through the straightening machine goes to an inspector, who tests for hardness. He marks the result on a sheet, which is kept as a record together with the order of the customer; and in the event of a complaint the hardness indication as well as the analysis of the steel used are available for each tube.

When material is intended for the Army or Navy, the tubes are turned over for final inspection to a Government inspector, who marks each tube passed by him with his own die, which, in the case of the Navy is an anchor, the initials U.S.N. and the inspector's own initials or sign.

Covering the Fuselage

Aluminum and its alloys are being increasingly used in aircraft construction. While sizes and gages of sheets are far from being standard they are usually of Nos. 12 to 30 gage, but mostly of Nos. 16 to 18 gage, corrugated. The corrugating varies with the builder. In general, sheets are used in wing construction, gas tanks, ship cabins, bottom lining, cowling, instrument boards, fuselage covering and incidental fittings such as battery boxes. On seaplanes, hull frames and sheathing, decking and pontoons are often made of strong alloy sheets. It is difficult to estimate the average amount of aluminum entering into an airplane, but it is noteworthy that in 1928 the aluminum used in aircraft increased about 250 per cent over the quantity consumed in the preceding year. As airplane production increased only about 150 per cent during that period, it appears that the use of aluminum has grown faster than the industry.

In the all-metal airplane, aluminum alloy sheets, usually duralumin, 17-ST, or Alclad sheets, are used almost exclusively. A Kansas City, Mo., builder recently experimented with welding thin-gage black steel sheets, for covering the fuselage, but the results are understood to have been less satisfactory than expected.

Pure aluminum sheets are used almost entirely for fuel tanks, which sometimes occupy most of the available space in the fuselage and in some cases are in the wings. The welded tank is preferred. Occasionally a riveted duralumin or Alclad tank will be specified and in a few instances tanks have been made of dairy tin plate. Some years ago copper tanks were rather widely used.

Aluminum, or alloy of aluminum, sheets for tanks are usually of Nos. 14, 16, 18 and 20 gages, depending upon the capacity of the tanks, which range from a few gallons in those designed for the wings or tail to as much as 550 gal. in a single tank on the larger air transports.

As with many other products entering into aircraft, tanks are far from standardized, each builder specifying the size and shape suitable to the plane being constructed. In certain of the larger craft, intended for long-distance flights, practically the entire interior, except the cockpit, will sometimes be composed of closely fitted tanks. So much space do they occupy that they are not only formed to the shape of the fuselage, but when necessary, as to pass controls and other wiring through, a

A FEW of the Shapes of Welded Aluminum Tanks for Aircraft Fabricated by the Paramount Welded Aluminum Products Corporation, Brooklyn, N. Y. In the foreground are sections of honeycombing for the interior

LARGE Capacity Aluminum Tanks with the Baffle Plates Riveted in Place and the Rivets Welded. This interior construction permits free flow of fuel to the motors, but prevents sudden shifting of the contents

section of pure aluminum tubing is welded into the tank from side to side, or across a corner. When the space through the tank for controls is large the tank is practically built around a hole.

For oil tanks, a number of builders specify tubes welded across the tank, usually at the ends, to permit circulation of air as an aid in maintaining a cool oil supply. Such tubing is almost entirely of pure aluminum, although the fittings on tanks are sometimes of aluminum alloy, which holds a thread more satisfactorily than the pure metal.

The accompanying illustrations show tanks of various designs for aircraft fabricated by the Paramount Welded Aluminum Products Co., 195 Morgan Avenue, Brooklyn, N. Y. The cross section baffles in all the larger tanks and most of the small designs are stamped from aluminum sheets and riveted into the tank interior to prevent sudden shifting of gasoline to one side, which might cause a heavily loaded plane to overturn. The baffle sections are constructed to permit free flow of fuel to the motor in any position.

Black Sheet Stampings

The industry uses a small tonnage of black steel sheets in the manufacture of miscellaneous fastenings and accessories. When stamped, or otherwise fabricated for use in exposed places, the usual requirement is Army and Navy specification No. 57-136-8, the analysis of which is C, 0.25 to 0.35 per cent; Mn, 0.40 to 0.60; P, 0.04 max.; S, 0.045 max., Cr, 0.80 to 1.10 and Mo, 0.15 to 0.25. Stampings in places where strength and resistance to corrosion are not so important are usually of Army and Navy specification No. 57-136-3 and have an analysis of C, 0.20 to 0.30, Mn, 0.50 to 0.80, P, 0.045 max. and S. 0.045 max. The finished stamping of either quality of sheets is always coated, usually with cadmium, to prevent corrosion.

Steel Cord and Tie Rods for Bracing

Wire and cord, or the number of tie rods used in a plane vary with size and design. A biplane with two wings to be braced with the landing and flying braces requires considerably more wire cord or tie rods externally than a monoplane. Until a few years ago, builders in most cases used wooden longerons, or main longitudinal members for the fuselage, and these were braced with wire, which could be adjusted to the proper tension by turnbuckles. This type of construction is still used, but chrome-molybdenum, high-carbon or aluminum alloy tubing, or rolled alloy aluminum shapes take the place of the wooden longerons. Tinned No. 10 or No. 20 gage steel wire, or tie rods of the exact length of the section to be braced are used.

Two active makers of tie rods are the Stewart Hartshorn Co., New York, and the MacWhyte Co., Kenosha, Wis. The rods range from 0.138 in., 6-40 thread to 0.625 in. in diameter, ⅝-18 thread and have a total ultimate strength of 1000 to 24,700 lb. in the streamline section, depending upon the size and from 1080 to 35,800 lb. in the thread section. They are made to A.S.M.E. specifications in the smaller sizes and to S.A.E. specifications in the larger sizes. The Army and Navy specification for tie rods compares with the S.A.E. and requires C, 0.40 to 0.50 per cent, Mn, 0.50 to 0.80, P, 0.045 max. and S, 0.050 max.

When used externally for flying or landing braces these tie rods are streamlined. For tying in the frame of the fuselage a square rod is usually specified. All such rods are plated, usually with cadmium. Sizes used depend upon the capacity of the plane, an ordinary light commercial plane requiring about 5/16-in. and smaller rods, the larger sizes entering into the heavy transports and bombing planes for the Army and Navy. All such rods are subject to careful inspection as with other products for aircraft, and in the case of the Stewart Hartshorn Co., all rods are subjected to a proof test load equivalent to 60 per cent of the specified breaking load.

While many manufacturers use tie rods throughout their planes, others specify steel aircraft cord. Of this, three principal types are used, the so-called hard, 19-wire strand, composed of 19 galvanized, or tinned wires stranded together, the so-called flexible 7 x 7 cord, composed of strands of seven galvanized or tinned wires, six strands around one, and the extra flexible, 7 x 19 cord, composed of strands of 19 tinned wires, in six strands around one. The illustration of cross sections is of cord manufactured by the John A. Roebling's Sons Co., Trenton, N. J.

For the wing bracing on biplanes, the usual practice, when cord is used is to specify 19 strand, galvanized or tinned, which is classified by the Army specifications as No. 48-21. In some instances, makers use 6 x 7, cotton center galvanized or tinned cord, Army specification No. 48-14A and occasionally 7 x 7, wire center, galvanized or tinned cord, Army specification No. 48-22. No special flexibility is required in the wire for this exterior bracing of the wings.

A substantial footage is required as the flying wires are generally double while the landing braces are either single strands of cord, or two small-diameter pieces are used, so that they may be streamlined by binding together with balsa wood between. When steel cord is used, turnbuckles are required. These range from 4½-in. to 9½-in.

Fig. 1. 19-wire Aircraft Strand

Fig. 2. 7 x 7 (Wire Center) Aircraft Cord

Fig. 3. 7 x 19 Aircraft Cord

from pin-eye to pin-eye, with strength of 800 lb. in the small sizes to 17,500 lb. on the larger sizes. The ends of the turnbuckles are of steel to S.A.E. specification No. 2330, while the barrels are of special bronze, Army and Navy specification No. 57-162.

A considerable length of the heavier cord is used in the interior for controls on the rudder, elevators and ailerons. The usual steel cord for this purpose is the 7 x 19, tinned, which is extra flexible. The sizes used vary from ⅛ to ¼ in. in diameter. While it is difficult to estimate the amount of wire used in an airplane, the total footage of the various solid wires and cords will range from 250 to 300 ft. in a small design using steel cord for exterior bracing and 500 to 700 ft. and more in a large passenger carrying plane. Some builders of monoplanes in the exterior bracing of the wings use a section of chrome-molybdenum tubing from the fuselage to the underside of the wings and this is streamlined by covering with aluminum sheet. By making these braces wide, one builder claims increased lifting power for the plane.

While galvanized wire is still used, the tendency is decidedly toward increased use of tinned wire, and wire with cadmium plating. As in the case of other materials, the wire and cord used are subject to numerous tests and are all manufactured to either Army or Navy specifications. In the case of wire and cord the two Government branches still retain specifications which vary slightly in some instances.

In addition to the wire and cord required for interior bracing of the fuselage, and wings, exterior bracing of wings, nose and tail and the controls, there is a moderate amount of insulated wire used in the wiring for lights, ignition, grounding and antennae, and welding rods are used for chrome-molybdenum steel tubing or rolled shapes.

Resistance to Corrosion a Factor

Second only to strength in aircraft construction is the factor of corrosion. When aluminum is used, further protection is not necessary, but aluminum alloy of the 17-ST type is subject to corrosive action, which has been overcome to a certain extent in the Alclad sheet. In the case of alloy steel, which is exposed, a protective coating must be applied to meet the Army and Navy test of 100 hr. in an atmosphere of salt spray. Galvanizing is sometimes used, but is being succeeded in many plants by cadmium plating, tin coating and other processes. Recently chromium plating for exposed parts made of aluminum alloy is being considered by manufacturers.

All bolts, nuts, rivets and wing reinforcement materials are either of heat-treated aluminum alloy or of alloy steel. While nuts are of ordinary steel, all bolts are made from nickel steel, according to S.A.E. specification No. 2330, or Army and Navy specification No. 1004-C, with an analysis of C, 0.25 to 0.35 per cent, Mn, 0.50 to 0.80 P, 0.040 max., S, 0.050 max. and Ni, 3.25 to 3.75. All bolts are heat treated to give a minimum strength of 125,000 lb. per sq. in.

Products Bear Makers' Marks

Whenever the product permits, there is a growing use among manufacturers of individual marking of materials. While not general, a number have adopted a system of marking bolts and similar small finished products with an X, the official designation of Army and Navy specifications and certain manufacturers add their own sign or letter. The Aero Supply Mfg. Co., College Point, N. Y., a manufacturer of bolts and other small products, whose entire production goes to aircraft builders, marks each bolt on the head with the Army and Navy X and a letter, changed each year, so that at any time the bolt may be identified as made by this producer in a certain year.

As the Army and Navy specifications have been revised considerably and are still subject to minor revisions from year to year, this identification enables the maker to determine at any time whether or not the bolt in question was made to the standard effective in the year designated by the mark.

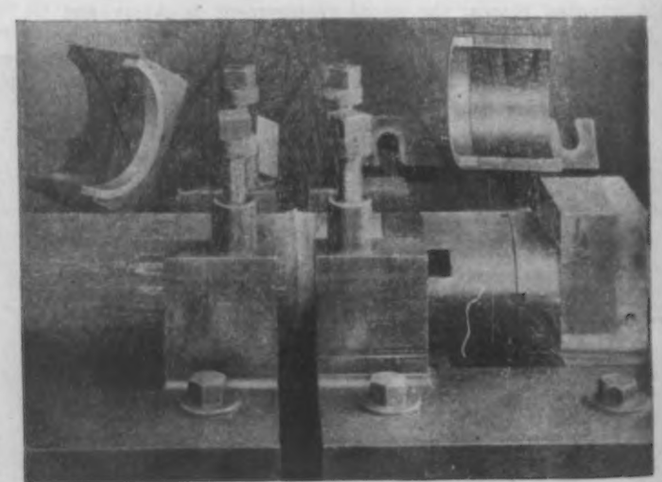
From this it becomes evident that, despite the requirements of lightness, strength and resistance to corrosion for material entering into aircraft production, this new and growing industry offers a source of increasing consumption of alloy steels. Non-ferrous metals, especially aluminum and its alloys, are being used extensively and will undoubtedly continue to be, and as the aircraft industry tends to reach a basis of quantity production, comparable to other great industries of the country, the factor of cost of materials as well as quality will be increasingly important, which should bring alloys of steel into still greater use by the builders of aircraft.

Flash Welds on Aircraft Tubing

JOINTS in the tubing forming the skeleton of aircraft are commonly welded with the oxy-acetylene flame as being well fitted for the thin gages of metal used, and the intersections are at such varying angles that hand work is the most economical method.

In some instances, however, a plain butt joint must be made between straight tubing, or an end fitting attached. Then a resistance flash weld is a logical solution. Cases in point are on the struts supporting the landing gear and on the motor fitting of the Ford tri-motored planes. The former is illustrated, lying in the lower jaws of the welding machine.

These welding jaws or dies are lined with Elkonite, a proprietary series of alloys of copper and tungsten. The copper gives the electrical conductivity required to pass the welding currents of large amperage, and the tungsten hardens and raises the melting point to resist wear and overheating. It is said that the dies shown are in perfect shape after 600 welds had been made, whereas the materials formerly used required redressing after 50 operations.



Terminal Strut Immediately After Welding (upper dies removed)

Obsolete and Inactive Patterns

Determining How Long They Should Be Kept— Practices of 80 Leading Companies Reviewed —Storage Charges Sometimes Levied

WHEN to dispose of the little used or obsolete pattern constitutes one of the difficult problems of industry, and affects the small firm as well as the large one. The purpose here is to present methods in current use by different companies in various fields of industry, in the hope that the information may be helpful.

The money expended for storing patterns is evident from the amount of storage space used. One firm has no less than 12 large warehouses filled with patterns; another has nine; others from one to seven or eight. Ingersoll-Rand Co. has, among eight large warehouses devoted solely to pattern storage, one which is 600 ft. long, 50 ft. wide and three stories tall. Sessions Foundry Co. has three good-sized warehouses for storing patterns, one being a large five-story building of modern construction.

B. F. Sturtevant Co., which has manufactured fans, blowers, and allied products for nearly 70 years, has accumulated a tremendous number of patterns. Its line is so varied that it may be called upon to furnish no less than 1,000,000 different repair parts, many of which are castings. At present the company is obliged to carry nearly 100,000 different patterns.

Several factors are to be considered before formulating a definite policy pertaining to the retention of patterns which are seldom used. One is the value of the pattern, measured in terms of its replacement cost, and the other is the obligation of the company to the customer to furnish repair parts or castings which require that particular pattern.

The value of a pattern ordinarily should be balanced against its cost of storage. An obsolete pattern might easily absorb, in storage cost over a given period of time, more than its worth. Often it is more economical to replace occasionally a pattern which has been destroyed than to invest thousands of dollars in storage facilities for patterns that are not being utilized.

No standard practice appears to be in use in the amortization of the pattern account. From replies received from companies all over the country, in different fields of manufacture, the rate varies from 10 per cent to 33⅓ per cent a year.

A wide difference of opinion exists concerning the obligation of a company to its customers in the matter of furnishing repair parts. It is interesting to note that the B. F. Sturtevant Co. recently had returned to it, for repair, a fan that was sold in 1865. The customer did not want a new one. The Krementz Co., Newark, N. J., several years ago received for replacement a 25-cent collar button of its manufacture which had been in continual use for more than 30 years.

"Obsolete" ordinarily means having gone out of use. However, when applied to patterns, the word takes on a different aspect. A pattern which may be classified as obsolete in one industry may not be in another. The type of industry and the nature of the product should be the determining factors in the interpretation of the word "obsolete."

Manufacturers of heaters, boilers and stoves frequently are called upon to furnish new grate bars and analogous parts for units of their manufacture which have been in service for many years. The sides of a stove rarely require replacement. Therefore patterns for old grate bars would not be classified as obsolete, whereas those for the sides of the same stove may be so considered. The nature of the product itself would govern the definition in this instance.

A large stationary steam engine of standard manufacture may have a life of 35 or 40 years in service. Its initial cost runs into a sizable figure. So long as the engine is in operation, parts for the engine which, because of wear or otherwise, may ordinarily require replacement should be available to the owner. The maker of the engine cannot therefore consider the patterns for those parts as obsolete, even though they may remain unused for a long period of time.

In the foundry, a different situation exists. The average jobbing foundry usually has on hand many patterns that belong to its customers, and which it is obliged to store as an accommodation. The foundry has little control over these, other than the knowledge from its own records as to their activity. The foundry is not in a position to judge the obsolescence of the patterns in question, but must be guided entirely by the owners' wishes.

Singer Mfg. Co. provides many metal patterns of each part for mounting on its molding machines. When a class or style of machine is superseded by a new model, all the obsolete metal patterns are destroyed, with the exception of one set, which is kept to fill orders for spare parts over a period of years. In this case, the pattern becomes obsolete when a new model is brought out to supersede the machine using a casting which required that particular pattern.

Organizations Setting Standards

Some effort has been made to set a definite method of procedure as standard in several fields of industry. To this end a number of trade associations have set standard practice recommendations for the guidance of their membership. The Ohio Foundries Association and the Newark Foundrymen's Association have adopted a "Uniform Trades Custom," that patterns not in use for six months shall be subject to storage charges.

The Steel Founders Society has issued a circular covering recommended trade customs, Section II of which reads as follows:

> The foundry shall not be expected to provide storage for patterns for which no orders have been received during a period of two years.

The "Standard Trade Customs" adopted by the Malleable Iron Research Institute incorporates the same ruling under Item 15.

The Machinery Builders Society, upon the recom-

NOTE.—From a report prepared by the Policyholders' Service Bureau, Service on Manufactures, Metropolitan Life Insurance Co., New York. The practices of about 80 machine builders and founders, in 15 States, from Massachusetts to Missouri and from Michigan and Wisconsin to Tennessee and Virginia, were drawn upon.

mendations made by its Committee on Obsolete and Inactive Patterns, recently adopted the following as standards for its membership:

1. All patterns, jigs and fixtures which are special for a job, and not likely to be used again, should be scrapped at the end of the guarantee period.
2. All other patterns, jigs and fixtures that have not been used for a period of five years shall be scrapped.
3. The customer shall be charged with the cost of replacing any of the above that have been destroyed after the stated period, the customer being advised of this fact on receipt of his order for repair parts.

The National Machine Tool Builders' Association states that, with the progress in machine tool design, the average life of the design of standard machines seems to be about seven years. Therefore, if economic life in the users' hands be counted as ten years, the user of the last machine produced on the design would be getting reasonable service if he could get a repair part from the original pattern ten years after the last machine of that design was made. This would give the user of the first machine of this design 17 years, in which he could obtain a repair part from the original pattern. This association therefore advocates that machine tool manufacturers should not under ordinary conditions carry patterns longer than ten years after delivery of the last machine of a type.

Utilizing Inactive and Obsolete Patterns

Many companies have found it not only economical from a cost standpoint, but also an aid in reducing the number of patterns to be stored, to make over the old pattern wherever possible into the new one. This of course necessitates cooperation on the part of the engineering department in so designing the new part that the old pattern can, at least in part, be utilized. It is well so to redesign the part that the new one can also serve as a replacement part for the old model.

Swartwout Co. finds that, as a rule, a pattern becomes obsolete when the company is building a revised model, but quite often it is possible to work the old pattern over to make a new one.

Terry Steam Turbine Co. endeavors in every case to redesign parts for the machines so that they will readily fit into the place of the old one, should replacement be necessary. In this case the obsolete pattern is destroyed immediately.

(In the second and concluding installment will be discussed the time element in connection with retention of patterns and methods of determining obsolesence.)

Action of Coal Dust When Applied to Molding Sand

IN a paper presented at the Third International Foundrymen's Congress in London, June 11 to 14, by Ben Hird on "Coal Dust as Applied to Molding Sand," the author attempts to prove, by practical experiments, the action of coal dust during the pouring of molds which have been faced with sand containing a percentage of this material, and the changed condition of the sand and coal dust after use. There appear to be no data of sustained investigations of the action of coal dust in sand molds.

Practically every foundryman has formed his own ideas as to what actually takes place, the most prevalent idea being that a slight film of gas, or smoke, on the face of the mold, prevents the molten metal from fusing the silica grains giving the casting a clean blue skin, instead of the rough gray appearance when no coal dust is used.

Mold Has Mica Window

A desire to observe what actually happens inside a closed mold during casting led to the adoption of a special mold with a mica window. The pattern, with strip of mica, was rammed up in the usual way in a three-parted box, with the mica in position and opposite the opening in the middle part. Before the pattern was withdrawn the intervening sand between the mica and the slot in the box was cut away, care being taken not to expose the extreme edges of the mica. The in-gate was cut in at the bottom joint. The mold was cast on a low stool to facilitate observation.

When molten iron was poured into the molds made with coal dust facing sand, smoke immediately began to rise up the sides of the mold. The thickness of this smoke varies with the amount of coal dust in the sand, and its volatile content. The top of the rising metal has the form of a meniscus, the convex face uppermost. The metal rises with a rolling action against the sides of the mold, due to the friction of the sand face. There appears to be a clear space, about ⅛ in. to ¼ in. (which follows the shape of the meniscus) between the top of the rising metal and the smoke. This is due to the intense heat of the molten iron.

It required very close observation to see the rising metal trap any of the coal gas. It is certain that this action takes place because the coal specks are giving off their volatile gases and continue for some time after the metal has covered them. Tests on anthracite coal seem to prove that the carbon deposit on the skin of the mold, created by the smoke from the coal dust, has only a preliminary and slight influence on the color and quality of the casting skin.

As the previous mica-window tests were all made on the vertical faces of the molds, further experiments were carried out to find the action of coal dust on the bottom horizontal faces. The advancing metal forms a very pronounced meniscus, which gives a rolling motion to the flow. Between the advancing metal and slight coal smoke there appeared to be a clear space, similar to that in the vertical experiments.

Superfine coal dust is the most efficient for heavy as well as light work. Coarse-graded coal dust, unless used in large proportions, when they cause other blemishes (such as pock-marks and ratching), are too widely distributed among the sand grains to function properly, and leave much of the sand on the mold faces unprotected, or so slightly covered that the coating is burned off by the heat of the metal.

Dust Must Be Superfine Quality and of at Least 30 Per cent Volatile Matter

Therefore, coal dust, as its name implies, must be the dust of coal, and for all classes of work should be of a "superfine" quality. Also, the volatile content should not be less than 30 per cent, in other words, a bituminous coal.

This action of the volatile matter in the coal during the casting of the mold explains the reason why used foundry sand is black, when coal dust is mixed with the facing sand. This can easily be proved by burning the black "used sand" in air. The carbon film will burn off, leaving a brown or gray silica grain, such as is left on the top of an open sand plate when a thin layer of black sand has been thrown after casting.

Southern Rod Mill Electrification

Synchronous Motor Drives and Unusual Motor Combination Used by Gulf States Steel Co. for Rolling Rods from 4-In. Billets

BY GORDON FOX*

A CONSIDERABLE part of the steel tonnage produced by the Gulf States Steel Co. is marketed in the form of wire products. Open-hearth ingots, 18 in. x 20 in., weighing 5400 lb., are reduced in a 36-in. blooming mill, engine driven, to 4 in. x 4 in. billets (nominal size; their section is 14.6 sq. in.). These billets supply the rod mill, which, in turn, delivers to the wire mills. About 80 per cent of the output of the rod mills is No. 5 rod.

The rod mill is of the Garrett type. Six 16-in. tandem roughing passes, of which the last four are continuous, are followed by twelve 12-in. strand and finishing passes arranged in a staggered train as shown in the diagram. This requires rather heavy drafts, especially in the earlier passes, the sectional area of the rod after the ninth pass being less than 0.25 sq. in.

This mill was previously driven by three steam engines. One engine was directly connected to the lay shaft of the continuous roughing stands, another engine drove stands Nos. *7* to *16* inclusive, through a series of rope drives, while a third engine drove finishing stands Nos. *17* and *18*. The steam for these engines was supplied at 150 lb. pressure by coal-fired boilers. The engines exhausted at about atmospheric pressure into a low-pressure line common to this mill and to the steam-driven blooming mill. Much of the low-pressure steam from these mill drives was utilized in low-pressure turbines located in the same building with the rod mill engines.

A study of the power, fuel and water supply for this plant indicated that substantial economies could be derived through electrification of the steam-driven mills, coupled with centralized generation of electric power in a new power plant located near the blast furnace plant. The connection with the Alabama Power Co. was maintained for the purchase of power required in addition to that generated in the new power house.

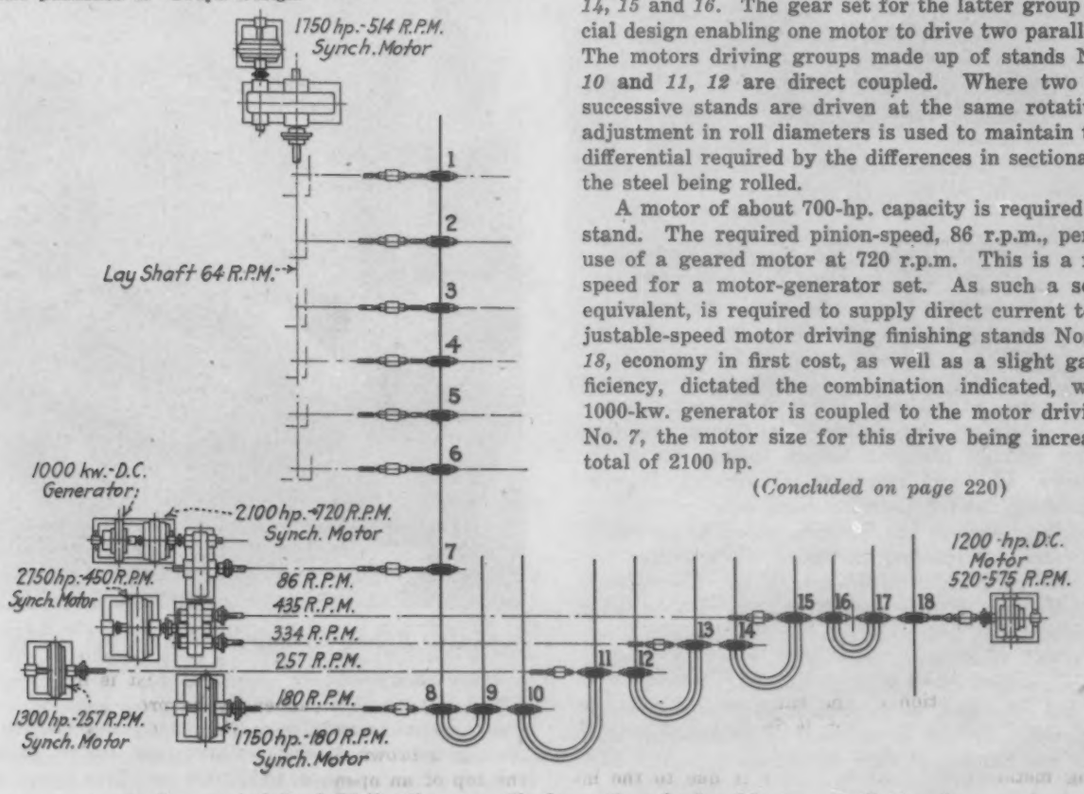
Electrification of the rod mill is of interest, first, because it involves the use of five synchronous motors in a system of subdivided or group drives. It is a pioneer application of this type. It is of interest, secondarily, because of the combination of one of the driving motors with a direct-current generator to make up a motor-generator set which, in turn, supplies the direct-current motor driving the finishing stands.

Arrangement and sizes of the driving motors are shown in the diagram. Rather high-speed motors with gear drives are employed for the continuous group, for stand No. *7* and for the group comprising stands Nos. *13*, *14*, *15* and *16*. The gear set for the latter group is a special design enabling one motor to drive two parallel shafts. The motors driving groups made up of stands Nos. *8*, *9*, *10* and *11*, *12* are direct coupled. Where two or three successive stands are driven at the same rotative speed, adjustment in roll diameters is used to maintain the speed differential required by the differences in sectional area in the steel being rolled.

A motor of about 700-hp. capacity is required at No. *7* stand. The required pinion-speed, 86 r.p.m., permits the use of a geared motor at 720 r.p.m. This is a favorable speed for a motor-generator set. As such a set, or its equivalent, is required to supply direct current to the adjustable-speed motor driving finishing stands Nos. *17* and *18*, economy in first cost, as well as a slight gain in efficiency, dictated the combination indicated, wherein a 1000-kw. generator is coupled to the motor driving stand No. *7*, the motor size for this drive being increased to a total of 2100 hp.

(*Concluded on page* 220)

*Electrical Engineer, Freyn Engineering Co., Chicago. From an article published in "Freyn Design."



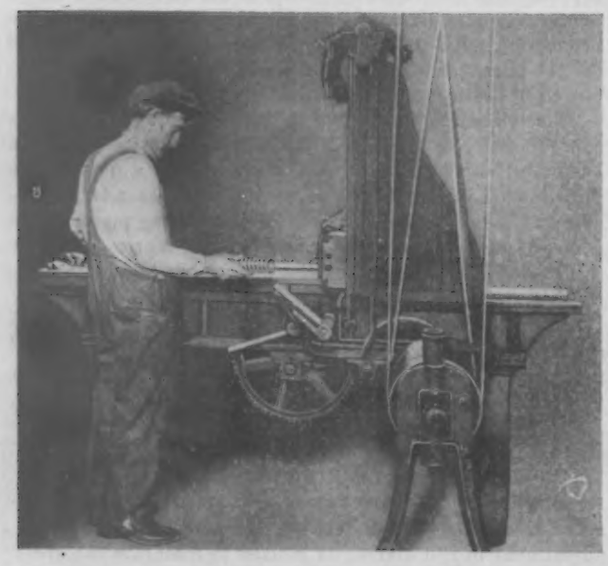
Layout of Rod Mill, Showing Shafting Speeds for Various Roll Stands

Heat Treating in Making Springs

Control of Physical Characteristics Necessary in Handling Steel Wire for Compression and Tension Springs

BY F. W. MANKER*

MOST of the raw material in the manufacture of coiled steel springs is wire. Most of this wire is heat treated at the wire mill in accordance with well established methods, before being shipped to the spring factory. But the spring maker is increasingly meeting consumer specifications which make it imperative for him to select unusual steels and alloys and to develop special heat treatments of his own.



Testing Springs for Solid Compression Under 3000-Lb. Pressure, to Remove Permanent Set

Among the springs which the Kokomo Spring Co., Kokomo, Ind., manufactures are those for counter-balances on garage and factory doors, and also for suspending the blades on road graders. These latter have a carrying capacity of 2800 lb. and weigh from 90 to 150 lb. each. This concern also puts out springs for about 100 different makes of trucks and tractors. Other items include automobile valve springs, agricultural implement springs, pump valve springs, phosphor bronze springs for steam pump valves, etc., and monel metal springs, sulphur dioxide resisting, for refrigerating machinery.

In designing springs the primary object is to secure continuous and intermittent deflection or movement of coils, without permanent set or stretching. Known supporting loads and definite deflections, the two variable factors encountered, bear a definite relation to each other. We might call them cause and effect, the load applied being the cause and the deflection the effect.

These are expressed in mathematical formulas, which include diameter of coil in relation to diameter of material used and number of coils, all governed by the fiber stress exerted and the tensile strength of the material used. These formulas show that the amount of angle or twist which a round bar is capable of producing under torsional movement is directly dependent upon the length of the bar or wire used in the spring, which in turn is controlled by the diameter and number of coils. Increasing either augments the factor of safety.

Increasing the size of material decreases the maximum fiber stress allowable, as all spring action is based upon the torsional or twisting action of wire. In other words, the greater the distance from the circumference of the bar to its center, the less twisting action will the bar safely stand. This is due to the greater movement of the outside fibers, which are in tension, as compared with that of the inside fibers which are, at the same time, in compression. The result is unequal strains and often failure of material.

Modulus of Elasticity Under Torsion

Carefully conducted tests show the modulus of elasticity of high or low-carbon Bessemer, open-hearth or

Automatic Spring Coiling Machine Used in Producing Springs at High Speed

crucible steel to vary from 25,000,000 to 30,000,000 lb. to the square inch under tension; but under torsion it amounts to only about 10,500,000 lb. This latter figure, together with a fiber stress of from 60,000 to 90,000 lb.

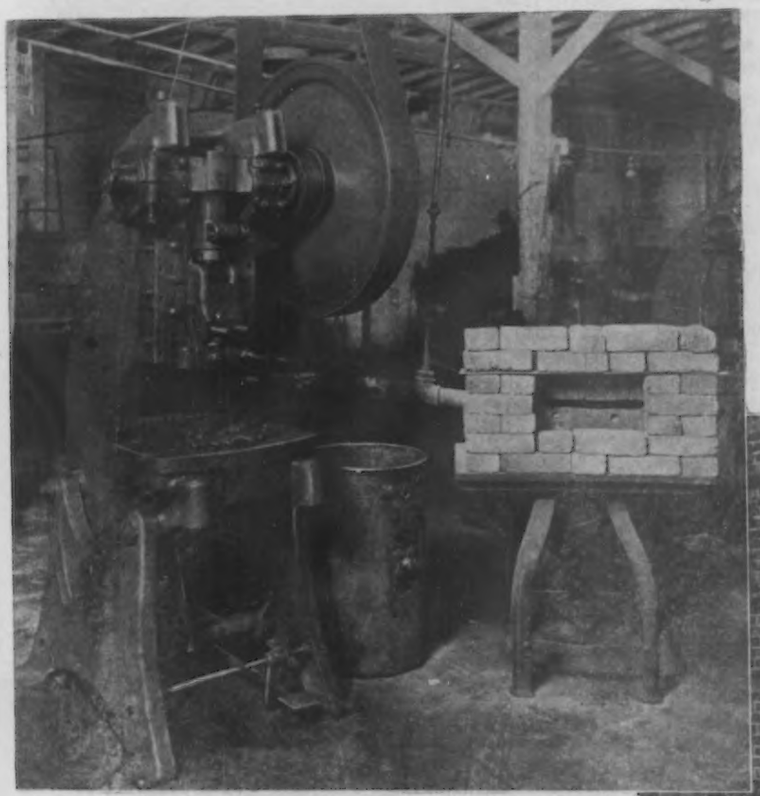
*Assistant to president, Great Lakes Steel Corporation.

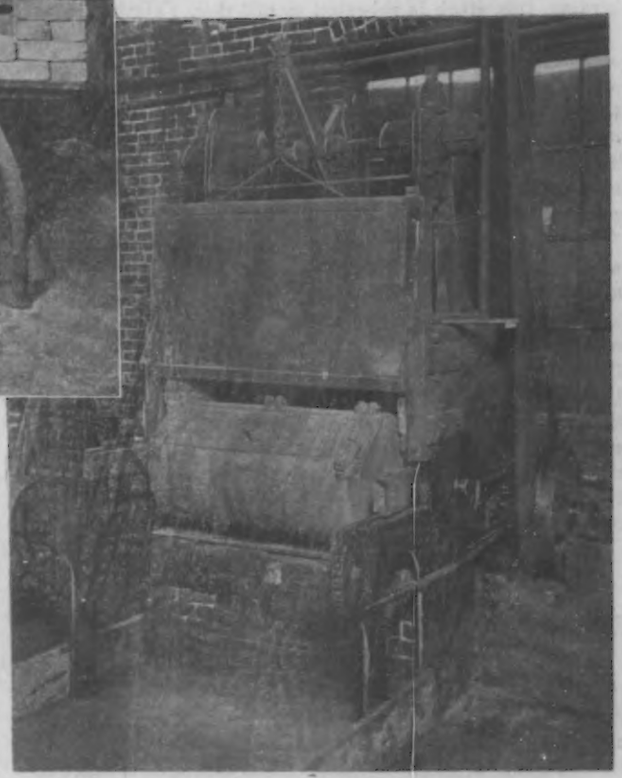
to the square inch, is used in the formulas of this concern.

In extension springs of the overhead door type is another factor, initial tension, which is due to mechanical crowding of one coil against another, and varies from a quarter to a fifth of the total load carried by the spring.

Owing to the variation in the modulus of elasticity as shown, it is almost impossible for all springs to be absolutely uniform; hence a commercial variation of plus or minus 10 per cent is usually allowed. When closer tolerances are required it becomes necessary to test each spring as it is produced, rejecting those which do not meet the specifications. This is expensive.

The greater the fiber stress developed under working conditions, the shorter is the life of the spring. The theoretical fiber stress for an ideal spring is 70,000 to 80,000 lb. and with it a spring should withstand 2,000,000 workings without failure. However, for moderate use this company has made springs, from its own special-process material, which have a tensile strength of 190,000 lb., working under 125,000 to 140,000 lb. fiber stress, with satisfactory results.





USE Is Made of Several Portable Gas-Fired Forge Furnaces, as at Left, Placed Alongside the Presses. With this equipment one operator can make 2000 small steel forgings in 9 hr. Below is a gas-fired drawing furnace of the rotary drum type, in which the drum may be run out for discharging

Furnaces for Hardening and Drawing

The heat-treating department of this plant is equipped with modern furnaces and other equipment, using gas as fuel. There is a row of gas furnaces, used interchangeably for hardening and drawing, which are 7½ ft. long, 5½ ft. wide and 9 ft. high. They are fired with 14 gas burners located in each end, each battery of burners being manifolded to an inspirator. These units are of brick, suitably insulated and stayed, and were built and installed by the Surface Combustion Co., Toledo, Ohio. Automatic temperature controls and indicating pyrometers are used.

One drawing furnace is of the drum type, the drum setting in a brick, combustion chamber, heated with 11 gas burners, manifolded to an inspirator. The drum revolves in pillow blocks, the shaft being driven by a motor through a gear train. The pillow blocks run on steel tracks placed in the side walls and extending 4 ft. beyond the combustion chamber, to aid in discharging.

Two furnaces, back to back, serve the dual purpose of tempering or blueing and japan baking. An overhead monorail system serves both, running out of one, making a complete turn and traveling the length of both on the outside, and making another turn to run into the other. The tempering oven is carried at 650 deg. Fahr. After being tempered the work is removed on the monorail, cooled, dipped in japan and run into the japanning oven, where the japan is baked on at 400 deg. Fahr. Each furnace is heated with 14 gas burners and an inspirator.

Quench tanks serve the various furnaces, oil being the principal quenching medium. Water coils, immersed in these tanks serve to cool them and the tanks have water jackets also. In the summer ice water is used.

All springs manufactured from material up to 9/16 in. in diameter are coiled cold, but anything larger must be heated first. For this purpose forging furnaces fired with gas are used. One of these is 50 ft. long, 3 ft. wide and 5 ft. high and has 16 gas burners and an inspirator on each side. This unit is heated to 1500 deg. Fahr., and will hold 25 1-in. bars at a time.

There are also two portable forging furnaces which may be shifted from one punch press to another. One

operator can forge 2000 ⅝-in. steel forgings from one of these furnaces in a 9-hr. day. All the furnaces in this plant are equipped with inspirators of the venturi type, made by the Surface Combustion Co. These economize in fuel, afford a close temperature control and make possible any furnace atmosphere required, oxidizing, neutral or reducing.

Oil was used prior to the conversion to gas and the fuel cost for heat treating with oil was 29.4c. for each 100 lb. With gas this cost now runs between 19c. and 23c. for 100 lb. Furthermore, rejections of spoiled stock, which formerly averaged 5 per cent, now amount to less than 0.1 per cent.

Chrome-vanadium steel, S.A.E. 6150, as used in this plant, is of the following analysis:

Carbon	0.45 to 0.55 per cent
Manganese	0.50 to 0.80
Phosphorus	0.04 maximum
Sulphur	0.04 maximum
Chromium	0.80 to 1.10
Vanadium	0.15 minimum, with 0.18 desired

In heat treating this the stock is brought up to a temperature of 1500 to 1525 deg. Fahr. and soaked for 10 to 20 min. Quenched in oil, it is then drawn at 800 to 1100 deg. for from 20 min. to 2 hr., according to the cross section, qualities desired, etc. To relieve any remaining strains, this stock is reheated to 650 deg. Fahr. for 1 hr.

Automobile valve springs are coiled from hard-drawn, silico-manganese wire, S.A.E. 9250. The analysis of this steel is similar to the one given, except that silicon (1.80 to 2.20 per cent) takes the place of chromium and vanadium, and the manganese content is 10 points higher. The only heat treatment required for springs of this steel is tempering, after all cold-working operations have been completed.

About 75 per cent of the springs made in this plant are coiled from wire already heat treated. These springs are of the extension type, as contrasted with the compression type, and must have an initial tension of approximately one-fifth of the total carrying load. It has been found in practice that oil-tempered wire affords from 25 to 30 per cent more stretch or elongation after coiling than regular spring wire. In the construction of extension springs it is necessary to crowd the wire, to produce the desired initial tension; and were they to be heated to 1500 deg. Fahr. after coiling, this initial tension would be lost.

In making compression springs the factor of initial tension does not enter. Hence this type of spring can be either made from heat-treated stock or coiled from regular wire and heat treated afterward. Here the deciding factor is cost. Thus, for some of these springs 1020 S.A.E. steel is used, of the following analysis:

Carbon	0.15 to 0.25 per cent
Manganese	0.30 to 0.60 per cent
Phosphorus	0.045 maximum
Sulphur	0.05 maximum

After coiling, the springs are heated to 1425 to 1500 deg. Fahr. for a half hour, quenched in oil and drawn at 900 to 1100 deg. The time of the draw ranges from 20 min. to 2 hr., depending upon the cross section of the material, physical requirements, etc.

Special Manufacturing Equipment

A novel machine in this plant is an emery wheel grinder for grinding both ends of a spring at the same time, and at the rate of 25 a minute. It is automatic and hopper fed and will take springs from ¾ in. to 15 in. long. This machine is being rebuilt to increase its speed by at least 25 per cent, using rubber-bond disks instead of emery wheels.

In some instances the ends of springs must be annealed, to offset stresses set up by severe forming (sharp bends, etc.), and in others the ends must first be heated before being formed. For this purpose a cast iron box with small holes is used. The springs are inserted in the holes in such a way that only the ends protrude into the box, where they are heated with a gas torch.

There are machines which can be adapted to make closed or open coils, and special speed lathes for turning out long springs, operating at 1500 r.p.m. and producing springs 150 ft. long, if necessary. Long lines of automatic coiling machines are used, which form any kind of spring, with or without tapered ends, closed or open ends and of any length, from stock ranging from 0.006 to 9/32 in. in diameter. One of these will turn out 180 springs a minute from 0.006 to 0.032-in. material.

A long line of punch presses is used for cutting springs to any length, or for forming special ends, and other machines for looped ends and for special-shaped flat springs. All compression springs are pressed to remove permanent set and all are tested to the full load specified.

All of the above machines are designed and made by the company, except the automatic coilers. This concern maintains a testing laboratory, and research and engineering departments, for designing new kinds of springs and the machines with which to make them.

Southern Rod Mill Electrification

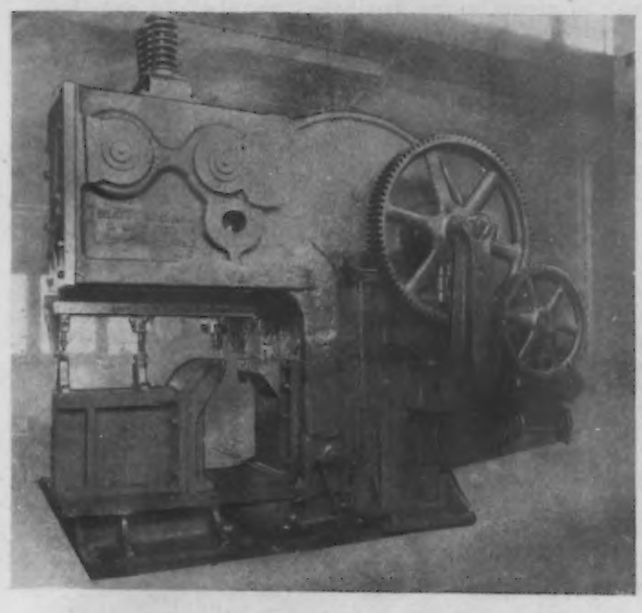
(*Concluded from page* 217)

Arrangements for starting and switching the synchronous motors are of interest. All of these motors, with the exception of the 2750-hp. unit, are arranged to start on full voltage, developing approximately full-load torque with three to four times full-load kva. The pull-in torque developed by these motors is about half of full-load value. The 2750-hp. motor is arranged to start normally with a reactor in series, to minimize the usual starting inrush. However, if the starting torque, under reduced voltage, should be deficient, as on a Monday morning, full voltage can be applied with no ill effects other than the high starting inrush.

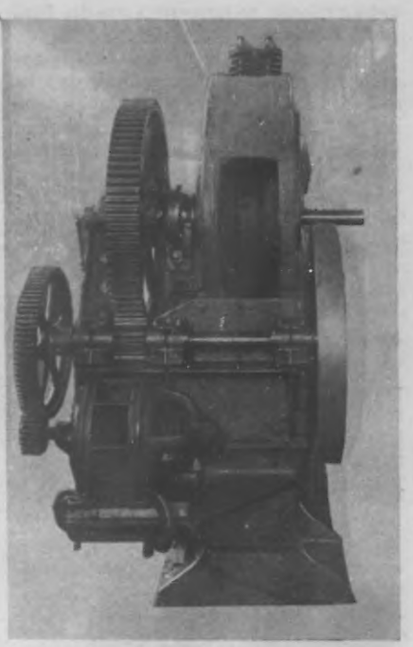
As these motors run almost entirely in one direction, the ability to back off being seldom required, it was not thought necessary to supply individual forward and reverse oil circuit breakers for them. Each motor is provided with a single breaker. A set of reversing disconnects is provided ahead of the bus supplying the entire group of synchronous motors.

This rod mill is provided with seven reels. Finishing at about 1600 ft. a minute, six strands are closely maintained, resulting in an average output of about 350 tons on a 12-hr. turn. The power consumption of the main roll drives, electrically driven, is about 200 kwhr. for a gross ton of product. This compares with a consumption of about 13,000 lb. of steam an hour used by the engines which formerly drove the mill. The reduction in operating and maintenance labor represents a marked economy in costs.

Pearlitic cast iron is being used to an increasing extent to replace cast steel and cast iron by British engine builders, if exhibits at the recent North-East Coast Exhibition may be taken as a criterion. So-called Lanz-Perlit fire bars were shown to be sound and unchanged in shape after 16 months of service in a boiler, whereas the life of ordinary gray iron castings would be only three months. Impact strength of the improved iron measured by blows to fracture is eight times that of the ordinary. Hardness is uniform, varying from the normal of 190 Brinell but slightly even in castings ranging from ¾ to 2½ in. thick.



USE of Two Toggles Permits Application of Pressure at Two Points on the Ram and Is Claimed to Reduce Power Requirements. The motor and all driving mechanism are mounted on the frame as shown in view at right



Beam Punch with Toggle-Operated Ram

BEAM punches for structural shapes and plates, differing from usual design in that a pair of toggles transmit pressure to the ram, are being built by the Beatty Machine & Mfg. Co., Hammond, Ind. Special features are that the ram is designed without overhang and it is guided throughout its full length. Use of two toggles affords application of pressure at two points on the ram, reduces the size of driving gears and is claimed to reduce power requirements. These machines will be built for ram pressures ranging from 150 to 600 tons.

To add strength to the head of the punch, the main body extending up in the housing has been made the same length as the face or space for tooling. The toggles are operated by a connecting rod which leads to the main shaft. This shaft extends through the frame at right angles to the face of the head and is fitted with an automatic stop clutch. The driving gears are assembled on the housing, thereby making for economy of floor space. The punch is of steel construction throughout, with slide bearings bronze lined and all shaft bearings bronze bushed and fitted with a single-shot force-feed lubricating system.

The machine illustrated has a stroke of 3 in. and exerts 400 tons' pressure. It will punch four 1⅛-in. holes through 1-in. material in cluster at any point at front or back of head. The length of head, front to back, is 60 in., and right to left, 12 to 40 in. as required. The die space, or distance from the face of the head to the table, stroke down, is 48¾ in.

Wheels and Casters for Industrial Trucks

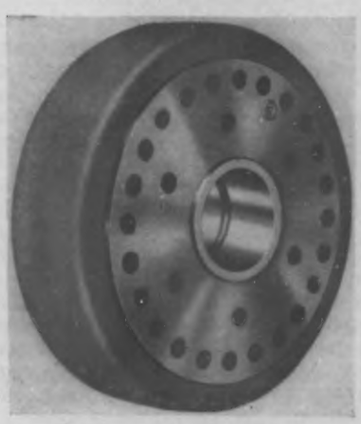
THE Metzgar Co., Grand Rapids, Mich., has added to its line of end-grain wood truck wheels for warehouse, hand and trailer trucks, a "super-strength" type for use on hand-lift and other trucks subjected to unusually heavy service.

In all types—standard, heavy-duty and "super-strength"—the wheels are made up of a number of hardwood wedges of equal size securely bound together with circular steel bands. These bands, with the hub flanges, are laid deep enough in the wood to provide the necessary radial strength, and are fastened by rivets which extend through each wedge. The butt ends of the wedges are surfaced, forming an end wood tread that is said to have wearing qualities comparable to a butcher's block. Various hub arrangements can be furnished.

Heavy-Duty End-Grain Wood Truck Wheel with Hyatt Roller Bearings

The wheels can be equipped with either oil-less end-wood plain bearings, or Hyatt roller bearings. The entire wheel is impregnated with a suitable lubricant, and this, in addition to the end wood presented to the axle, is said to provide a plain bearing that will last indefinitely in ordinary trucking operations. Micrometer measurements taken after several months' service are said to show no appreciable wear of either the end-wood bearings or the axles with which they are used. If desired, however, Alemite-Zerk lubrication can be furnished for the plain bearing wheels. Roller bearing wheels are recommended when higher speeds and easier rolling than usually obtainable with plain bearings are required. These bearings are regularly equipped for Alemite lubrication.

The standard type end-grain wood truck wheel is made in a range of sizes from 2½ to 20 in. diameter, inclusive. The rivets in the side plates are countersunk to make both sides of the wheel perfectly flush, so that less space is required in the horns when the wheels are used in swivel or rigid casters. Compression tests of 10-in. diameter, 3-in. face wheels of standard



"Super-Strength" Wheel for Hand-Lift and Other Unusually Heavy Service Trucks

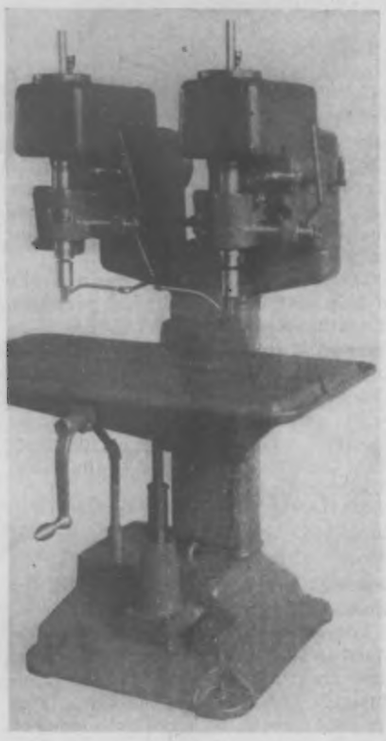
type are said to have withstood a load of 21 tons.

For heavier service than usually required of two-wheel warehouse trucks and four-wheel platform trucks, the heavy-duty type wheel having double the number of wedges and rivets is recommended. Sizes range from 6 to 20 in. in diameter, and up to 6 in. in face width, the 6 to 9 in. wheels being of plate type and larger sizes of band type. They are made in a wide range of hub lengths and to fit any size of axle.

End-grain wood wheel casters are manufactured by the company in both rigid and swivel types for a variety of industrial applications.

New Semi-Automatic Tapping Machine

TO eliminate tap breakage, a multiple-disk friction clutch is incorporated in the spindle drive of the semi-automatic tapping machine illustrated, single and multiple-spindle types of which are being built by the Rickert-Shafer Co., Erie, Pa.



Work May Be Tapped to a Predetermined Depth and Means Are Provided to Eliminate Tap Breakage

For production on an automatic basis, a block on a serrated cam located on the left-hand side of the spindle housing may be set to permit tapping to a predetermined depth. Pulling the handle downward engages the clutch and causes the tap to advance into the work. When the required depth is reached the block on the serrated cam trips the mechanism so that the clutch is released in one direction, setting in operation a train of gears which reverses the spindle and backs the tap out of the work. A slight upward thrust on the handle then reverses the mechanism for tapping the next piece. On work of ordinary type one operator can keep two spindles going full time.

The machines can be furnished for either belt or motor drive. Pump and other equipment for supplying coolant or oil to the taps is provided and the arrangement is such that the overflow is returned to the reservoir in the base of the machine. It is stated that the machine has been tested in tapping up to 1-in.—8 U.S.S. threads without signs of being overloaded.

Cut-Off Saw for Brass and Bronze Bars and Shapes

BRASS and copper bars 3-in. in diameter are cut-off in from 3 to 4 sec. by the machine illustrated, which has been developed by the Hunter Saw & Machine Co., Pittsburgh, for cutting off brass, bronze and copper shapes, solid and tubing. Angular as well as straight cuts can be made on the machine, the capacity of which is for material up to 3 in. in diameter.

The 10-in. diameter saw blade is mounted on a balanced tilting frame and is fed through the material by means of an offset hand-lever, the work being held in a quick-acting eccentric vise. The saw blade is driven by a 3-hp. motor through roller and chain and sprockets, and runs at a peripheral speed of 1300 ft. per minute.

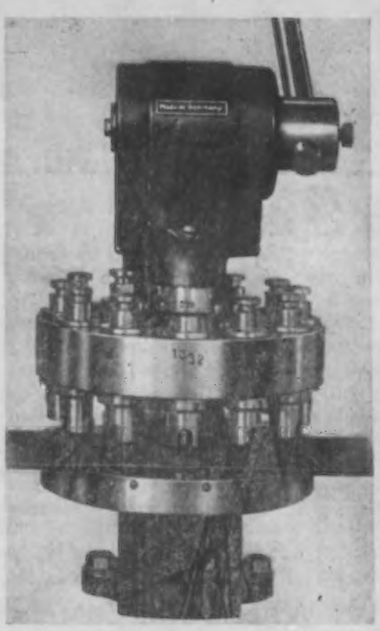
The Saw Blade Is Driven by a 3-Hp. Motor Through Silent Chain and Operates at 1300 F.P.M.

Means are provided for keeping the chain at proper working tension. The motor and starter are inclosed in the base of the machine. The saw guard is arranged to tilt out of the way to facilitate removal of the saw blade.

Floor space of 24 x 48 in. is occupied and the height of the machine is 45 in. overall. The height to the table is 31 in. The net weight of the machine, which is designated as the Model No. 4, with standard motor and starter, is 950 lb.

Will Punch 12 Different Size Holes

TO meet a demand for a portable machine ready at a moment's notice for punching holes of a range of common sizes, the Eda multiple punch here shown has been built. It covers any one of 12 sizes ranging from ⅛ to ½ in. and is designed rigid enough to pierce steel of machinery grade up to 3/16 in. in thickness. The punches and dies, which are simple, are mounted on a freely revolving turret, an automatic ball stop catching the turret at the moment that a desired size punch and die are central under the ram. Angle and tee sections up to 1¾ in. are included within the scope of the punch.



Holes from ⅛ to ½ In. May Be Punched in 3/16-In. Steel. The weight is 100 lb.

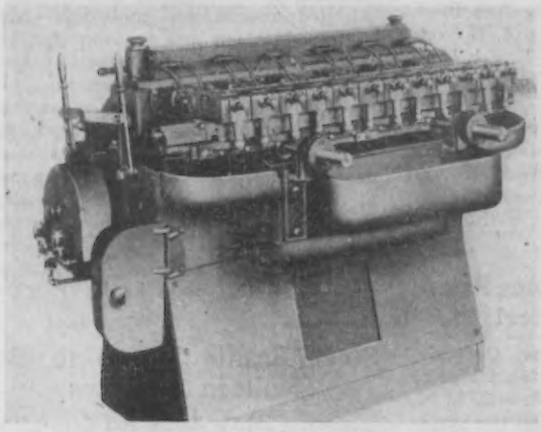
The machine, which weighs under 100 lb., is marketed by the Wiedemann Machine Co., 1815 Sedgley Avenue, Philadelphia.

Electric Furnace for Heat Treating Aluminum Sheets

The Fairmont Mfg. Co., Fairmont, W. Va., producer of aluminum sheet and castings, is installing a large electric heat-treating furnace. The equipment will be used chiefly in heat-treating aluminum-alloy sheet. Dr. Robert J. Anderson, vice-president of the company, states that the new furnace will be in operation by about Sept. 1.

Multiple-Spindle Driller Uses Cluster Drill Heads

FOR either single or cluster head work the Kent Machine Co., Cuyahoga Falls, Ohio, is bringing out a new horizontal drilling machine which is similar to its No. 1 six-spindle unit, but is larger and heavier and incorporates new features, including the cluster drilling mechanism. It is built with six single spindles on 7½ in. centers or with six special cluster drill heads on 7½ in. centers.



THE Single and Cluster Drill Heads Are on 7½-In. Centers. Twelve fixtures are required, two for each drill head, and six of them are loaded while six others are being drilled

Fixtures may be designed to accommodate a wide variety of work. Either belt or motor drive is furnished, the motor for the latter being mounted on a movable angle plate in the base of the machine to facilitate adjusting the tension of the driving chain and the changing of sprockets to vary the speed of the machine.

The rate of production is governed by the r. p. m. of the camshaft, which is controlled through a series of change gears and adjustable dogs. With this combination it is possible to synchronize the speed of machine with the ability of the operator to load and unload the fixtures. Feed of the drill is controlled by a feed cam and may be varied to suit requirements by changing the gears which control the camshaft speed.

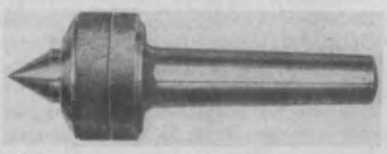
Twelve fixtures are required, two for each drill head. These fixtures alternately occupy positions in front of and between the drill heads. When in line with the drill heads, they are automatically locked, and when in the alternate position they are opened to permit unloading and loading. Thus, while the drill table moves forward for the drilling, six fixtures are filled by operator while six other fixtures securely hold the parts being drilled.

Live Center for Use with Tungsten Carbide Tools

A HEAVY-DUTY live center, said to be suitable for use in connection with lathes and other machine tools using tungsten carbide cutting tools, is pictured herewith.

This device, manufactured by Nielsen, Inc., Lawton, Mich., consists of an outer tapered sleeve, an alloy-steel heat-treated center mounted in double-row ball bearings at the front and in a roller bearing at the rear, and a knurled front cap containing at its forward end a felt seal. The center and its bearings run in oil that is supplied through oil holes at the front and rear of the tapered sleeve. The knurled front cap permits convenient removal of the alloy steel center, while the felt seal is intended to prevent entrance of dust or grit into the front bearings.

The tool, designated as the D.R., is regularly made in a Morse taper series, embracing eight sizes from No. 3 to No. 7, and a Jarno taper series of 15 sizes, from No. 6 to No. 20. The overall width and length of the Morse taper series ranges from 2¼ in. x 6 5/16 in. to 9 in. x 20 in. and of the Jarno taper centers from 2¼ in. x 5 13/16 in. to 5 5/16 in. x 16 in. The radial and thrust load sustained by the Morse taper series ranges from 600 to 29,000 lb. per sq. in. per 100 r.p.m. The standard included angle of the center point is 60 deg. Special tapers and points can be furnished to order.



Anti-Friction Bearings Are Used Front and Rear. The knurled front cap contains a felt seal at its forward end

In a recent test of one of the No. 6 centers at the Case School of Applied Science, Cleveland, in connection with a lathe using a tungsten carbide tool, cast iron was cut at 500 ft. per min., the depth of cut being ⅝ in. and the feed 0.037 in. Steel containing 0.50 per cent carbon, 0.75 per cent chrome and 1.5 per cent nickel was cut at 200 ft. per min., the depth of cut being ¼ in. and the feed 0.037 in. It is claimed that in both cases the center withstood the load without chatter.

Completes Investigation of Machinists' Vises

AN investigation of the efficiency of various weights of machinists' vises has been completed by the Bureau of Standards. The relationship between size of vise and its efficiency was determined by performing typical shop operations on steel specimens held in the vise. These operations consisted of sawing, bending and riveting, and were carried out under carefully standardized conditions, using 12 vises of the stationary bottom type having different lengths of jaw from 2 in., 9 lb., to 9 in., 282 lb.

Static tests, such as sawing, in which the movement of the tool was large compared with the movement of the vise, showed no appreciable difference in the efficiency with which the work was performed. In the dynamic tests, however, such as riveting and some of the bending tests on large specimens, the weight, or inertia, of the vise had an appreciable effect on the efficiency with which the work was performed. The efficiency of the 5½-in., 102 lb., vise was greater than for any of the lighter vises, but was about the same for larger vises. Complete results of this investigation will be published by the Department of Commerce in the near future.

Dual Buffer with Independent Spindle Control

TWO separate and distinct spindles, each operated by its own motor, feature a dual-motored Tex-drive buffer made by the Hisey-Wolf Machine Co., Cincinnati. Either spindle may be operated independently of the other. This arrangement makes it possible to have the two spindles operating at different speeds at the same time.

This new buffer is of gooseneck design, which gives the operator great freedom of movement and permits easy handling of large and bulky pieces. Accessibility of all parts and rigidity of construction are incorporated. The base consists of a substantial casting inside of which are motor, starter and starting switch.

Spindle and bearing housing are assembled as a unit. The entire unit may be quickly removed from the base by loosening four bolts on each side. This arrangement simplifies the problem of removing a worn or broken belt and replacing it with a new one.

Spindle bearing boxes are cast iron and are keyed to the column. A key along the entire base of bearing housing fits into a keyway in top of the column. Thus, no matter how often the bearing housing is taken off, the keyway arrangement insures perfect realinement of spindle and motor pulleys. Automatic lubrication is obtained by a simplified oiling system.

General Mileage Scale for Cast Iron Pipe

WASHINGTON, July 22.—The Interstate Commerce Commission, in what is known as the Krupp Foundry cast iron pipe scale, has ordered the railroads to use the mileage scale prescribed in the so-called Hoch-Smith iron and steel case, for the removal of undue prejudice against founders at Lansdale and Quakertown, Pa., and Florence, N. J., and undue preference for founders in the Birmingham, Chattanooga and Knoxville districts.

In the original decision in the Krupp case the regulating body designed a scale, but did not prescribe it by definite order, to be used by the railroads in measuring the difference between the rates from shipping points of the Eastern founders and the shipping points of the Southern founders to the same destinations east of the Mississippi River and north of the Ohio.

Commissioner Porter, who wrote the report in which the revision of the original Krupp report was made, said there was no reason why the scale prescribed in the general iron and steel case, applicable throughout the territory north of the Ohio and Potomac rivers and east of the Mississippi, should not be used. But the scale in that case was not long enough. Therefore it was lengthened from 1200 to 1500 miles. The added distance of 300 miles is divided into alternate 35 and 30-mile blocks. One cent per 100 lb. is added for each block so that at 1500 miles the lengthened scale, to be used in calculating the differences in rates, is 65c. per 100 lb.

The result of the use of this scale is that the differences at the competitive points will be somewhat less than they would have been had the scale suggested but not ordered in the original Krupp report been put into use.

Swedish Bearing Industry Expanding

Production of ball and roller bearings in Sweden has expanded rapidly during recent years, according to E. J. Cochrane, industrial machinery division, United States Department of Commerce, the 1928 production being estimated to have reached between 33,000,000 and 35,000,000 Swedish kroner ($8,844,000 to $9,380,000), compared with 24,167,000 ($6,476,756) in 1926 and 26,524,000 ($7,111,432) in 1927.

As only a small part of this production can be used in Sweden, outlet for the balance must be found abroad. In this Swedish manufacturers have succeeded in increasing their foreign sales from some 23,409,000 kroner ($6,271,200) in 1925 to nearly 33,000,000 kroner ($8,844,000) in 1928. In Europe, Germany, Russia, the United Kingdom, France, Belgium and Czechoslovakia constitute the best customers. On the North American continent, both Canada and the United States are excellent markets, and in South America and Asia, Argentina and Japan, respectively, are the heaviest buyers.

Manufacture of ball and roller bearings in Sweden is practically confined to four companies, namely the A/B Svenska Kullagerfabriken (S. K. F.), Goteborg; the A/B Nafveqvarns Bruk, Navekvarn; the A/B Abjorn Anderson, Svedala; and the Skogsfors Bruks A/B Reftele. Of these the A/B Svenska-Kullagerfabriken (S. K. F.), Goteborg, is the largest. This company was established in 1907 and owns 12 factories, four of which are located abroad, in the United States, England, France and Germany respectively. In addition, it has 187 sales branches scattered throughout the world.

Central Alloy Reduces Prices on Nirosta Steel

The Central Alloy Steel Corporation has announced substantial price reductions on Enduro Nirosta steel, covering all forms in which the material is produced. Central Alloy is working toward greatly increased output of stainless steel in response to rapidly growing buying interest in many lines, including the automobile and building industries. The present price reduction, it is stated, is the first step in the company's policy to stimulate consumption by lower quotations as the volume of output expands.

Gearing Advertising to Selling

"Gearing Advertising to Selling" will be the theme of the eighth annual convention of the National Industrial Advertisers Association to be held in Cincinnati, Sept. 30, Oct. 1 and 2, it has been announced by Jesse R. Harlan, chairman of the convention committee of the Cincinnati Association of Industrial Advertisers. Sherman Perry, American Rolling Mill Co., Middletown, is chairman of the program committee.

Officers of the national organization are: Nelson S. Greenfelder, Hercules Powder Co., Wilmington, Del., president; George H. Corey, Cleveland Twist Drill Co., Cleveland, first vice-president; Allan Brown, Bakelite Corporation, New York, second vice-president; H. von P. Thomas, Bussman Mfg. Co., St. Louis, third vice-president, and Benjamin H. Miller, Permutit Co., New York, secretary and treasurer.

American Pulley Co. Buys Sprucolite Line

The American Pulley Co., Philadelphia, manufacturer of pulleys, steel hangers and hand trucks, has taken over all products of the Sprucolite Corporation, Bloomfield, N. J., embracing various types of pulleys. The new line, to be called American Sprucolite pulleys, will be marketed through mill supply houses.

Engineering Meeting at Akron in October

A meeting of the American Society of Mechanical Engineers will be held in Akron, Ohio, Oct. 21 to 23, at the Portage Hotel. Eight sessions are being planned under the auspices of the professional divisions and standing committees on the following subjects: Applied mechanics, materials handling, education and training for the industries, aeronautics, steam power, iron and steel, and management.

A dinner, followed by a smoker with entertainment, is being arranged at the Firestone Club House for Monday evening, Oct. 21, and a banquet at the Portage Hotel for Tuesday evening. Inspection trips planned cover the plants of the Firestone Tire & Rubber Co., the Goodyear Tire & Rubber Co. and the B. F. Goodrich Co.

Steel Frame House to Be Built in 100 Days

Moving into a house 100 days after the digging for the foundation was started is an achievement which will be demonstrated this month at Indianapolis, where a steel frame house will be erected by the Steel Frame House Co., a subsidiary of the McClintic-Marshall Co., Pittsburgh. The house, consisting of eight rooms, two baths and garage, will measure about 40,000 cu. ft. The contractor will be an assembler, for the materials will be fabricated in plants at some distance from the house while the foundation is being built and will be shipped to the site ready for erection.

The house will demonstrate the durability and economy through speed of erection that is possible with steel framing. The Steel Frame House Co. has built or is building similar houses in Philadelphia, Lancaster, Pa., Rochester, N. Y., Toledo, Ohio, and Columbus, Ohio. The plans for the Indianapolis structure were made by Frederick Wallick, Indianapolis architect.

Will Make Bartlett-Snow Equipment in England

Pneulec, Ltd., Mafeking Road, Smethwick, near Birmingham, has been given exclusive selling and manufacturing rights in the British market for Bartlett-Snow special machinery for handling sand, molds, cores and castings. Among these products are conveyors and elevators of many types, screens, magnetic separators, sand conditioners, pug mills, blenders, sand hoppers, gates, feeders, core crushers and cupola charging units.

S. G. Taylor Chain Co., Hammond, Ind., is preparing for distribution a catalog which has eliminated many items in conformity with the company's simplification program. It will give information relative to sling chains, especially as to diameter and dimension of joiner and end links.

Plans Outlined for Distribution Census

Business Men's Group Appoints F. M. Feiker of Associated Business Papers, Inc., as Chairman

A GROUP of business men which will aid the Government in the census of distribution to be taken next year by the Department of Commerce met in Washington on July 17 to draw up preliminary plans for the collection of what was described as "vitally essential statistics."

F. M. Feiker, managing director of the Associated Business Papers, Inc., was named chairman of the group. In discussing the work before the committee, Mr. Feiker said there seemed to be six important objectives in the minds of business men and economists who have given the distribution census consideration. He described these as follows:

1. To provide a statistical picture or count of the number of distributers classified as to class, as to size, as to number of employees, as to the volume of business. Such a count or census of distributers forms the simplest picture of the outlets for distribution between the consumer and the producer. There is at the present time no such picture and the contemplated census of distribution should include the first simple objective.

2. A count and classification by establishments of the volume of sales in various commodities to be classified by commodities, by geographical units, by volume of sales as related to size of establishments, etc. It is obvious that a discussion and clarification of this objective is essential before consideration can be given to the detailed contents of schedules.

3. The use of the statistics briefly summarized above from the point of view of those who produce commodities, i. e., from the point of view of their use for establishing market possibilities and sales quotas both by groups of producers and by individual producers. Much of the demand for a census of distribution comes from producing groups such as manufacturers, sales and advertising organizations which seek to use the distribution statistics to advance the economical distribution of their particular commodities, both raw materials and manufactured products. This objective also includes a consideration of the distribution of goods from manufacturer to manufacturer and a consideration of the problems of a census of distribution of manufactured commodities.

4. The consideration of the use of distribution statistics by trade association groups representing wholesale, retail and service outlets which seek to analyze the relation between their volume and the volume of other commodities or between the sectional demands existing within the distribution of one class of commodities. There have grown in increasing volume broad problems of competition between industries, one commodity competing with another for the consumer's dollar. There is basic need for considering therefore relative present sales in lines of commodities on the part of the distributer of those commodities as well as on the part of the producer. If practicable, a distribution census should be projected which would allow totals to be classified in a way to produce comparative figures of this sort.

5. The use of the statistics by the individual distributer or producer who seeks to make comparison between his own volume of business and the volume of business of his group either considered nationally or, in the case of the retailer, locally. It is obvious that the average business man would like to see a census of distribution established this year which would enable him to make such comparisons.

6. There remains the public value of the assembly of such statistics as are proposed whereby social or economic groups having as their objective studies in living costs or housing costs, living standards, etc., would seek to find in these statistics totals for comparison which they could put to broad public use.

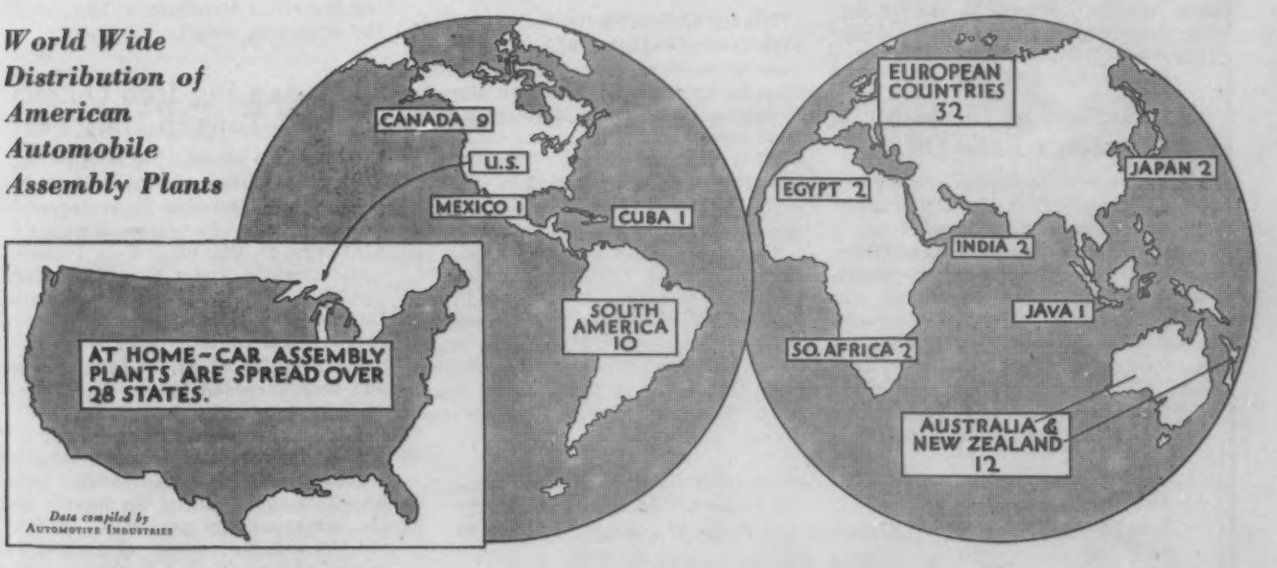
An Appreciation of The Iron Age

An appreciation of this journal appeared in the Chicago *Daily News* of July 12 in connection with a brief article devoted to Alvin I. Findley, editor-in-chief. What that newspaper had to say of THE IRON AGE is in part as follows:

"Its weekly market service is well known and has been one of the most trustworthy indexes of business. This service is not intended as a forecast; it aims primarily to picture current conditions in the iron and steel markets as they are each week.

"THE IRON AGE market service is the fruition of many years of cultivation. Technique of reporting had to be developed and an antagonistic psychology had to be overcome. The importance of publishing facts, instead of optimistic exaggerations, was not appreciated when business men believed that sentiment was a controlling factor in influencing trade conditions. No one has done more than Mr. Findley in breaking down these obstacles and in unswerving devotion to unbiased, uncolored news."

World Wide Distribution of American Automobile Assembly Plants



THERE are 72 plants in countries outside the United States, scattered through Canada, South America, Europe, Africa, India, Japan, Australia and New Zealand in which native labor is employed to assemble American motor cars. These plants turn out more than one-third of all of the cars made throughout the world outside the United States. According to a survey by A. B. Crofoot in *Automotive Industries*, there are 155 assembly plants for American cars, 87 of them within the United States.

Heavy Orders for Fabricated Structural Steel

Orders for fabricated structural steel in June are reported by the Department of Commerce at 92 per cent of monthly capacity, the computed tonnage having been 354,200. This is an increase of 2 per cent over the May total of 346,500 tons, and has been exceeded only once—by the 353,500 tons of March last. An equal tonnage, however, was reported for August, 1928. The current figure compares with 296,450 tons for June, 1928.

Shipments fell off markedly in June, having been only 273,350 tons computed, compared with 311,850 tons in May. While the June total was the smallest since February, it showed a gain over the 261,800 tons of June, 1928.

For the first half-year new orders are computed at 1,936,500 tons, compared with 1,570,800 tons last year. The gain represents 23 per cent. Similarly, shipments in the half-year were 1,686,300 tons, compared with 1,424,500 tons last year. This shows a gain of 18½ per cent.

Iron and Steel Traffic on Rivers Gaining

River traffic in iron and steel products on the Ohio River amounted to 116,679 tons during June, compared with 102,162 tons in the preceding month and 96,156 tons in June, 1928, according to the figures of the United States Engineer Office, Pittsburgh. On the Monongahela River, June commerce in steel products totaled 116,157 tons, compared with 88,340 tons in May and 75,422 tons in June, 1928. June steel movement on the Allegheny River was 722 tons, against 525 tons in the preceding month and 2350 tons in June, 1928.

Production of Malleable Castings Falls Off

Production of malleable castings in June is reported by the Department of Commerce at 71,055 net tons, a decline of more than 12 per cent from the 80,901 tons of May and the smallest tonnage for any month so far this year. It compares, however, with 67,090 tons in June, 1928, showing an increase of 6 per cent from last year.

Shipments in June were 71,311 tons—smaller than that for any previous month this year, except February. This compares with 79,885 tons in May and with 66,737 tons in June, 1928.

Orders booked in June, at 64,581 tons, made the smallest total for any month this year. This compares with 76,673 tons in May and with 61,071 tons in June, 1928. Capacity was operated in June to the extent of 73.8 per cent, compared with 83 per cent in May.

For the first half-year, production was 466,396 tons, which represents an increase of 18 per cent over the 394,876 tons last year. Shipments were 461,839 tons, showing a gain of almost 20 per cent over the 385,228 tons of last year. Orders booked totaled 463,700 tons, an increase of 21 per cent over the 384,009 tons of last year.

Consumption of Lake Superior Ores

Ore from Lake Superior consumed in June is reported by the Lake Superior Iron Ore Association at 5,676,652 gross tons. This is a reduction of more than 5 per cent from the 5,980,248 tons consumed in May. It shows an increase, however, of about 21½ per cent over the 4,667,493 tons consumed in June, 1928.

Ore on hand July 1 amounted to 23,701,011 tons. This is an increase of more than 3 per cent compared with the 22,980,603 tons of July 1, 1928. The current figure includes 19,618,611 tons on hand at furnaces and 4,082,400 tons on Lake Erie docks. This ore serves a total of 264 furnaces, of which 196 were in blast on May 31 and 197 on June 30.

Canadian Automobile Production in 1928

Eleven companies operating 14 factories were engaged in making automobiles in Canada in 1928, according to a bulletin of the Dominion Bureau of Statistics. Production made a new high record at 242,054 cars, valued at $149,177,000 wholesale. The output was 18 per cent greater than in 1926—the previous best year—and the value was 22 per cent higher.

Complete passenger cars made in 1928 numbered 176,096, of which 77 per cent were closed. In addition, chassis for passenger cars numbered 21,752. Complete trucks made numbered 17,527, showing a sharp decline from the 29,603 of 1927. Truck chassis to the number of 26,679 were produced.

Foundry Equipment Orders Up Slightly in June

Foundry equipment orders in June were slightly in excess of shipments, according to reports received by the Foundry Equipment Manufacturers' Association from 19 of its members. June net orders stood at 177.3, the base of 100 representing the average for 1922, 1923 and 1924. Unfilled orders were 300.8 at the end of June, or nearly double the June shipments, which were on the basis of 172.7.

Increase in Commodity Prices

Wholesale prices of commodities are reported by the United States Bureau of Labor Statistics at 96.4 in June, compared with 95.8 in May and with 97.6 in June, 1928. All figures are based on 100 as the average of 1926. Five of the 10 major groups showed increases in June, compared with May, and five showed decreases.

Increases were registered by farm products, foods, hides and leather, fuel and lighting and the miscellaneous group; decreases by textiles, metals, building materials, chemicals and drugs and house furnishings. In no case did the decrease of any group exceed one unit, but some of the increases were considerably more than that.

Metals and metal products dropped from 105.2 to 105.1, through declines in the iron and steel figure from 98.4 to 98.2, and in non-ferrous metals from 104.9 to 104.8. There were no changes in the figures for agricultural implements, automobiles or the other metal products. Building materials showed a slight decline, caused mainly by drops in prices of lumber and bricks. The structural steel element for building materials remained at 99.6, as for the preceding month.

Canada's Pig Iron Output 518,557 Tons in Half Year

Production of coke pig iron in Canada during June amounted to 89,873 gross tons, according to a statement issued by the Dominion Bureau of Statistics at Ottawa. This tonnage, while slightly under the 97,379 tons produced in June of a year ago, was the second highest reported for the current year to date, being 9 per cent over the total of 81,464 tons in May and only exceeded by the 93,939 tons of February.

For the six months ended June 30, 1929, the cumulative production of pig iron in Canada was 518,557 tons. This tonnage replaced the figures for the corresponding period of 1918 at 501,000 tons as the second highest on record and was only 1 per cent under the high level of 524,000 tons, which was established in the first half of 1917. During the first six months in 1928, production amounted to 468,013 tons. Output for the half year under review included 401,758 tons of basic iron, 87,052 tons of foundry iron and 29,747 tons of malleable iron.

Production and Shipment of Raw Materials and Finished Products

	June, 1929	May, 1929	June, 1928
By-product coke (a), net tons	4,509,564	4,664,242(b)	3,961,268
Beehive coke (a), net tons	721,500	597,400	301,600
Total coke (a), net tons	5,231,064	5,261,642	4,262,868
Total coke (a), daily average	179,179	172,585	143,642

(a) United States Bureau of Mines.
(b) Highest total for any month.

This Issue in Brief

Skilled labor shortage is inevitable unless apprentice-training is more extensively adopted. United States has 4½ million skilled mechanics. To maintain this number at least 675,000 apprentices should be in training. Actually, less than 200,000 are being trained.—Page 203.

* * *

Economic weather signals. Average commodity price advanced in June to 96.4, compared with 95.8 in May and 97.6 in June, 1928. Orders for fabricated structural steel were heavy for June, being 92 per cent of capacity, a gain of 2 per cent over May.—Page 226.

* * *

Cadmium-plating, tin-coating and other processes are succeeding galvanizing in many plants manufacturing aircraft parts. Now chromium-plating for exposed parts made of aluminum alloy is being considered by manufacturers.—Page 214.

* * *

Are you wasting valuable storage space on patterns you will never use again? Value of pattern should be balanced against storage cost. Often it is more economical to replace an occasional pattern than to invest thousands of dollars in storage facilities for patterns not being utilized.—Page 215.

* * *

Electrification of rod mill involves use of five synchronous motors in a system of subdivided or group drives. One motor is combined with a d.c. generator to supply current for the motor driving the finishing stands.—Page 217.

Heat-treating fuel costs cut 22 per cent in spring plant. Gas fuel also reduces rejections from 5 per cent to less than 0.1 per cent.—Page 220.

* * *

Tungsten-carbide tool cuts cast iron at rate of 500 ft. a minute. Depth of cut was ⅝ in., and feed 0.037 in. Lathe was equipped with heavy-duty live center, made especially for use with tungsten-carbide tools.—Page 223.

* * *

Big market for fuel tanks in aircraft industry. Welded aluminum sheets are used almost entirely. Tanks are built to conform to shape of the fuselage, and are honeycombed with baffle plates to prevent sudden shifting of contents.—Page 213.

* * *

Pearlitic cast iron is replacing cast steel and cast iron in British engine building, if recent exhibit may be taken as criterion. Fire bars of the improved iron are still sound after 16 months service. Ordinary gray iron castings last only 3 months.—Page 220.

* * *

Apprentice-training not an added expense if quota of apprentices is correct. Work of apprentices is usually done well enough to carry labor cost and all indirect charges.—Page 204.

* * *

Lifting button permits convenient handling of cupola coke-charging buckets. A cone-type button is fixed at upper end of a steel shaft through the center of bucket, which has a dump bottom.—Page 210.

Predicts closer attention to material costs in aircraft industry, as quantity-production methods are adopted. Investigator believes this will encourage even greater use of alloy steels for aircraft parts.—Page 214.

* * *

Charge storage space for patterns not in use for six months. Two gray iron foundry associations have adopted this rule. Steel foundries destroy patterns for which no orders have been received within two years.—Page 215.

* * *

Coal dust for sand mold facing should be "superfine" quality, of not less than 30 per cent volatile content. Coarse-graded coal dust functions improperly, because of uneven distribution among the sand grains.—Page 216.

* * *

Makers of small parts used in aircraft construction are showing a growing tendency to "trademark" the part and also to add a symbol denoting year of manufacture.—Page 214.

* * *

Increases cupola output 25 per cent by using hot blast. Automobile foundry cuts coke consumption 30 per cent and gives cupola linings longer life by abandoning cold blast.—Page 208.

* * *

Flash-welding dies lined with copper-tungsten alloy are in good condition after 600 welds. With die materials formerly used, dies are said to have required redressing after 50 welds.—Page 214.

A. I. FINDLEY
Editor

THE IRON AGE

W. W. MACON
Managing Editor

ESTABLISHED 1855

Tariff Dust Clouds

ONE grows weary of reading the vehement exaggerations, published voluminously in recent weeks, telling what foreign Governments will do to the hurt of American trade if the present Congress raises existing duties. We are told with increasing insistence that our European debtors cannot pay us what they owe if we build up tariff walls so high that they cannot send us their products. The statement is so self-demonstrating—and so many Americans have been saying practically the same thing for so many years—that the reader wonders why so much strength is expended in reiterating it. Of about the same caliber would be the rejoinder that if American duties are made so low that foreign goods flood our markets industry here would be so depressed that Europe could no longer get loans from us wherewith to pay its debts.

No one really expects that the new tariff rates will be made so high that Europe cannot send us goods; and it is equally unlikely that they will be made so low that any domestic industry will have to put workers in idleness while low-priced products of its European competitors come in freely. In spite of all the thundering in the index, Europe, Canada, Argentina and the rest will do a great deal of buying from the United States after the new tariff bill is enacted, and the shipments of foreign products into this country will not be in materially smaller volume than in the years last past.

Whatever may have been said for partisan reasons in recent discussions at Washington, no one will seriously contend that the good will of foreign buyers—and sellers—is not to have weight in the making of our tariff schedules. President Hoover did well to remind Congress in his message last March that "in determining changes in our tariff we must not fail to take into account the broad interests of the country as a whole, such interests including our trade relations with other countries." At the same time he gave the right answer to foreign critics when he said that no discrimination against any foreign industry is involved in equalizing the difference in costs of production at home and abroad, "thus taking from foreign producers the advantages they derive from paying lower wages to labor."

We scarcely need say that it is the conversion of these generalizations into definite terms of ad valorem and specific duties that makes the trouble. But men who have sat on the Ways and Means Committee or the Senate Finance Committee learned long ago that predictions of domestic producers and those of importers as to the effect of a proposed rate on the volume of domestic or import business were far different from what actually happened when the identical rate took its place in the law. This, too, even when the rate in question had all the sanctions of so-called expert comparison of wage rates and other elements of foreign and domestic costs, for costs have far less to do with determining the destination of an order than tariff theory has ever taken into account.

Those whose tariff platform makes the welfare of the greatest number the criterion of all rate making will be glad to see the Senate bill drafted on the basis of recognizing any economic changes, since the present tariff was enacted, that have put domestic producers at a disadvantage. What is in order is not such a wide range of rate increases as the House bill provides, but, in accordance with promises made in the campaign of 1928, such reasonable amendment of the act of 1922 as is called for in the light of seven years' experience under it.

Paying for What One Gets

A CARDINAL principle of buying, as exemplified by the practice of Uncle Sam, is to accept the lowest bid that will meet the specifications. Other things being equal, this is a very good rule, and many people outside governmental circles practice the same method. Unfortunately, "other things" usually are not equal. This has been brought out forcibly in an article by Morton C. Tuttle, Boston builder, in the Boston *Evening Transcript*. While his comments related to building construction, their application is far wider.

Mr. Tuttle spoke particularly of low bids based on a series of cut-throat prices obtainable from certain sub-contractors. He pointed out that most often, when such bids are accepted, the orderly and timely progress of building is interrupted by delays caused by "sub-contractors of all degrees of ineptitude, * * * hard at work making confusion, delay and waste." And as "the progress schedule for a modern construction job is a complicated time-table fixing the arrival and departure of the different trades," a loss of time in one element throws the whole schedule out of gear, and no one profits.

Particularly troublesome are the results of such delay when the high costs of modern city building are involved, with heavy interest accruals. Or when the structure is urgently needed at a particular time, and prospective business is lost if it be not ready.

If modern automobile works were subjected to such conditions the cars would cost the public far more than they do. A plant building cars without a

stockroom, depending upon regular, prompt, uninterrupted supply of the parts, including sub-assemblies; another one running on a basis of a 5-hour storage of the necessary parts, and more goods constantly in transit to take the place of what is used from hour to hour—these schedules could not exist without the utmost reliability of their suppliers, all along the line.

A low price may be an adequate price for what one gets in exchange for it. But if what one wants or needs is beyond the scope of the low bidder, the price is low in seeming only, and a higher one might better be paid.

Automobile Exports Not So Large

WHEN very heavy automobile production was predicted for the present year it was explained that, while the domestic market might have difficulty in absorbing a large increase, there was room for a very considerable expansion in exports. Observing the remarkably heavy production reported month by month this year one might assume that the prediction was being fulfilled. As a matter of fact, however, exports have increased less than the domestic trade. Comparing the first five months of last year and this, there was an increase of 48 per cent in the number of cars and trucks produced, while the number exported increased only 33 per cent. The remainder, left for the domestic trade, represents an increase of 51 per cent.

The matter is somewhat complicated because in common thought we have two different conceptions of automobile activity, one derived from the monthly statistics of car and truck production, the other from the purchases of materials by the industry. These purchases provide for the manufacture of exported parts. For the domestic trade parts need hardly be considered, for we have the statistics of production, and there are only replacement parts in addition. For the export trade we have in addition to exported units the exports of parts for foreign assembly, and there may be an important increase there when none is shown in the complete units exported. Therefore we compile a brief statement to cover substantially the whole ground, considering cars and trucks first and then exported parts.

Cars and Trucks

	Produced in U. S.	Exported	Export Per Cent
1925.....	4,265,830	303,059	7.1
1926.....	4,300,934	305,528	7.1
1927.....	3,401,326	384,309	11.3
1928.....	4,358,759	507,253	11.6
1929*.....	2,677,781	273,499	10.2

*Five months only.

The jump in percentage from 1926 to 1927 is to be noted; but in 1928 there was only a negligible increase, while thus far this year exports have not increased as much as production. Since it might be suggested that there is a difference in domestic and export seasons it may be mentioned that in the first five months of last year the export proportion was 11.4 per cent, substantially typical of the whole year.

Next we have exported parts, which are reported separately as engines, parts for foreign assembly, and parts for replacement. The table below gives the total of the three, and to convey an idea of the importance of the parts the value of cars and trucks exported is given:

Automobile Exports, Value

	Cars and Trucks	Parts
1925.....	$222,784,738	$86,990,232
1926.....	223,763,952	87,135,601
1927.....	278,297,096	102,357,758
1928.....	355,112,806	135,780,267
1929*.....	179,759,581	103,466,688

*Five months.

For four years parts held just even with complete units exported, at 37 to 39 per cent, while this year the proportion jumped to 58 per cent.

Admittedly the export trade of the automobile industry, in units and parts, is very important, but it is far from large enough to take the edge off a large decline in the domestic demand should one occur, and the domestic demand of the last 12 months has been phenomenal by comparison with its slow growth in immediately preceding years.

Protecting Inventions Abroad

JAMES L. BROWN, chief of the patent and trademark section of the Bureau of Foreign and Domestic Commerce, writing in *Commerce Reports*, urges upon American exporters a greater interest in protecting their inventions by patents in foreign countries. Mr. Brown sees that too little attention has been paid to the subject and as a consequence there has been loss of trade to foreign competitors. He would have the machinery manufacturer take out patents in Great Britain, Germany, France, Canada and every other country where the particular type of machinery is built, and also in every country where it is used or where there is indication of a future demand. American manufacturers agree to this in principle, but they know that much money has been wasted on useless patents abroad and are more discriminating than they used to be.

The attitude of inventors and makers of patentable articles in the period since the war has been a changing one. In the stress of war production European manufacturers overcame much of their prejudice against American industrial methods and equipment. After the Armistice there was a feeling in the United States that this change of mind marked the beginning of a new era in European industry, which should mean a huge demand for much of our equipment that had come to be indispensable here. Consequently there was something of a rush to secure patent protection abroad on the many inventions of war time. But in the great unsettlement of reaction the anticipated quick market failed to materialize. Capital was not at hand to assist; enthusiasm waned here, and some apathy developed regarding foreign patents.

There has been, of course, no neglect to patent abroad the important inventions in the newer fields, as the radio, airplane, electrical, motion picture and automobile. In addition, in the last year or two, according to patent attorneys, there has been a general renewal of patent activities, due to the growing importance of foreign markets for American manu-

factured products. But those interested are proceeding with discrimination. To cover by patent large geographical areas is costly, not only in the initial stages, but in the annual or biennial fees which must be paid in nearly all countries, under penalty of automatic cancellation.

The situation in Germany is probably the most difficult. To secure protection there an invention must be more than an improvement or refinement. It must approach closely to the basic, for it must involve, to quote the law, a new "technological effect." Therefore, many inventions, patentable here and in most other countries, cannot get by in Germany. It often happens that, as Germany is coming to be our most formidable competitor in fields where new inventions play a large part, the American manufacturer feels that if a German patent is not procurable it is not worth while to seek protection in other countries.

There is abundant evidence, according to patent authorities, of the wisdom of careful study before deciding to seek patent protection abroad. The fact is that a large percentage of such patents on American inventions have been permitted to lapse after a year or two for non-payment of fees. Yet foreigners seem not to have taken advantage of such removal of protection. Nor has failure to work American inventions abroad, under the compulsory working clauses existing in all countries except the United States, developed many instances of competitors making use of the inventions. If an invention is not worth protecting by payment of fees or by working, either by the owner or under royalty, it is fair to presume in most cases that it was never worth the trouble and cost of patenting.

Coke By-Products Do Well

COKE by-product values have increased slightly in the last three years, belying fears entertained long ago that the general saving of by-products would so flood the market as to bring about unremunerative prices. The by-products are many and prices have moved variously, but the general trend has been as stated. The Bureau of Mines has put out a compilation showing for various years the total value of coke by-products, whether sold or consumed by the producer, per ton of coke made. The figures are given below, and as commodity prices generally have fluctuated we add the Bureau of Labor's index number of all commodity prices at wholesale, with a computation dividing the by-products value by the index number. This in essence is reducing the value to terms of the 1926 dollar, 1926 being the base year of the commodity index:

Value of Coke By-Products Per Ton of Coke Made

	Actual Value	Commodity Index	Converted Value
1915	$2.19	69.5	$3.15
1917	3.01	117.5	2.56
1922	3.32	96.7	3.44
1923	3.48	100.6	3.46
1924	3.51	98.1	3.58
1925	3.58	103.5	3.45
1926	3.52	100.0	3.52
1927	3.66	95.4	3.84
1928	3.66	96.7	3.78

Apart from the upward trend of values, both absolute and relative to commodity prices in general, the coke producers have had the advantage of lower coal prices in the last few years. Coal as charged into ovens last year had an average value of $3.57, against $3.87 for 1927 and $3.88 for 1926. As these values include widely varying freights paid they are no indication of the f.o.b. mine price.

The realization involved in the table of values includes breeze. Excluding breeze, the sales of by-products, to affiliated departments and to outsiders, totaled $151,309,528, and that was three-fifths of the delivered value of the coal used. Half the total was realized on gas, $76,498,857; the next largest item was ammonia, in sulphate and liquor form, $27,340,056; then followed in order tar, $17,544,797, and motor benzol, $16,832,646.

Since 1919 there has been rather a slow growth in the number of by-product ovens—from 10,379 on Jan. 1, 1920, to 12,544 at the beginning of this year. But more ovens than thus indicated have been built, as not a few have been dismantled. There has been a sharp increase in the production from 30,833,951 net tons in 1920 to 48,313,025 net tons in 1928, chiefly by reason of beehive coke being displaced. At the present time, however, by-product construction is quite active.

CORRESPONDENCE

Appeals for Invaluable Apparatus for Museum

To the Editor: The Rosenwald Industrial Museum of Chicago is the result of an endowment of $3,000,000 made by Julius Rosenwald, for the equipment and maintenance of the institution, and a $5,000,000 bond issue voted by the people of the city to the South Park Commissioners for the restoration of the old Fine Arts Building in Jackson Park, which will permanently house the technical collections.

In this museum the history of science, engineering and industry will be interpreted, not only by three-dimensional working models, but (and this is something that has not been attempted anywhere) also so presented that the social and economic causes and results, the little known background of all of the epoch-making inventions and discoveries, will be clarified.

We have recently learned that a Newcomen engine stood for many years on the shores of Newark Bay and was finally junked because no institution would give it a permanent home. The big Corliss beam engine that ran the Pullman Works met a similar fate. It is quite conceivable that there are still in existence many of these technical relics, in some inconspicuous corner.

We should like to appeal to your readers who may know of the location of some invaluable pieces of apparatus which might well find a home in the first industrial museum in America. If so, their communications, addressed to the director of the Rosenwald Industrial Museum, 300 West Adams Street, Chicago, will be most welcome.

JOHN A. MALONEY,
Assistant to the director,
Rosenwald Industrial Museum.

Chicago.

New Card of Extras Issued

Manufacturers of Cold-Finished Steel Bars and Shafting Announce Price Revisions

MANUFACTURERS of cold-finished steel bars and shafting issued a card of extras on July 15 which supersedes the previous card, dated Oct. 17, 1927. Hereafter this will be known as the "card of extras" instead of the "standard classification of extras" and it will be included in the "Manufacturers' Standard Practices."

Features of the new card of extras are briefly summarized in the following paragraphs:

There are no changes in the size extras on rounds, squares, hexagons and flats.

Extras for odd and intermediate sizes.—There are no changes except that the "odd size" extra applies on specifications for less than 20,000 lb. of one size and grade for shipment at one time.

Extras for turned and polished steels.—These have been increased and in some instances, especially on smaller sizes, advances are substantial. Extras shown under date of Oct. 17, 1927, and preceding cards were entirely too low and manufacturers have been handling this character of business at a loss. The new extras will permit the manufacture of this character of material at a reasonable profit.

Extras for chamfering.—No changes.

Boxing and burlapping.—The only change is the omission of the "burlapping extra of 15c. per 100 lb." While railroads require shippers to burlap (both ends and middle), all less-than-carload shipments weighing less than 24,000 lb., manufacturers recognize the increased tonnage handled by electric traction lines, steamship companies and motor truck haulage, and on these movements burlapping, required by railroads, is not necessary.

Extras for special composition.—It will be observed that this is set up in a different way. Extras A, B, C, D, G, H, I, J and K are the same as in the previous card, though some of these—B, C, D, I, J and K—were not published. The principal changes, in E and F, represent a reduction.

Extras for special finish.—This displaces the extras in the Oct. 17, 1927, card applying on "piston rod steel." The new extras are the same as the old on sizes 1⅛ in. and larger, while on the smaller sizes they are higher. This is because most of the product is now made by the cold drawing, grinding and polishing process, the cost of which is represented by the new extras. Heretofore manufacturers have used a special list (unpublished) to cover cold drawn, ground and highly polished bars and the new extras on sizes smaller than 1¼ in. are substantially the same as the unpublished list.

Extras for long and short lengths.—It will be noted that the extras for lengths shorter than 84 in. have been increased slightly and that some new brackets have been added. Extras for lengths 84 in. to 119½ in. are unchanged, as are the extras for lengths longer than 24 ft. Two new paragraphs have been added. These are explanatory.

Quantity differentials.—The extra for lots (one size and grade for shipment at one time) less than 500 lb. has been increased from $1 to $1.50, while the extra for lots—500 lb. to 999 lb. has been increased from 75c. to 90c. per 100 lb. The new extras represent the actual cost of handling these small quantities. Prior to this, manufacturers have not been fairly compensated for the heavy cost of getting out these small lots, which the jobber is so much better equipped to handle. No changes have been made on lots 1000 lb. to 1999 lb., or on lots 2000 lb. to 3999 lb.

Extras for accuracy.—These have been revised completely. In most instances, the new extras are lower than those shown in the previous card, and it will be observed that the headings are different. In other words, the extras for oversize accuracy have been omitted, as it is the manufacturer's practice to work from a given size to a specified tolerance undersize. The revision of these extras clarifies a condition which in previous cards was sometimes misunderstood.

Standard manufacturing tolerances.—These are unchanged.

The new card of extras is to become effective at once. However, as most buyers are under contract for the third quarter, it will not become effective in such cases until Oct. 1, the beginning of the next contract period. Buyers under contract for the third quarter will be given the benefit of the new "extras for chemical composition," as all changes here represent a reduction.

Committee Will Advise On Census of Manufactures

WASHINGTON, July 23.—George G. Crawford, president, Tennessee Coal, Iron & Railroad Co., Birmingham, Walter S. Tower, Bethlehem Steel Co., Bethlehem, L. S. Horner, president, Niles-Bement-Pond Co., New York, and Clarence M. Wooley, president, American Radiator Co., New York, are among a list of 18 members of an advisory committee on census of manufactures invited by Secretary of Commerce R. P. Lamont to assist in planning for the 1930 census of manutures, which is intimately associated with the coming fifteenth decennial census. The committee will meet at the Department of Commerce here on Thursday of the present week for the primary purpose of discussing coordination of statistics covering the nation's manufacturing output with the census of distribution data to be collected next year for the first time.

The advisory committee is made up of manufacturers, economists, statisticians and others. This is the third census advisory committee which has been formed, the other two, the advisory committee for the census of unemployment and the advisory committee for the census of distribution, having held sessions in the department last week. It is planned to organize a fourth advisory committee in connection with the census of population.

In a general sense, according to Secretary Lamont, discussion at Thursday's conference will include the scope of the manufactures census schedules, the establishment of a line of demarcation between the manufactures census and the census of distribution, and determination of additional inquiries, if any, which it might be desirable to include to throw more light upon the distribution enumeration, which represents a new government undertaking.

According to officials of the Census Bureau manufacturing activities are classified, for census purposes, into 340 separate industries, of which 114 are canvassed by means of a general schedule and 226 by special schedules. The combined number of inquiries on all the manufactures schedules used at the census of 1927 amounted to nearly 15,000. It is believed to be highly essential to consider special schedules, industry by industry, and that recommendations regarding a particular schedule should be solicited only from the industry or industries concerned.

The suggestion has been advanced that the question whether the rather detailed inquiry with regard to the numbers and horsepower of the several classes of prime movers (steam engines, steam turbines, hydro-turbines, etc.) in use in manufacturing establishments shall be carried on the schedules at every biennial census of manufactures or shall be carried only at alternate censuses. This subject and that regarding quantities of coal consumed are among the many topics which the committee probably will discuss.

Secretary Lamont Appoints Unemployment Committee

WASHINGTON, July 23.—Complying with a resolution adopted at the recent meeting of the advisory committee for the unemployment census that a small executive committee be named to cooperate with the Department of Commerce in drawing up an appropriate questionnaire and in making plans for the unemployment enumeration, Secretary of Commerce R. P. Lamont has extended invitations to the following persons to become members of the committee:

Dr. Joseph H. Willetts, University of Pennsylvania, Philadelphia; William Green, president, American Federation of Labor, Washington; J. Chester Brown, chief statistician, Bureau of Labor Statistics, Department of Labor, Washington; William A. Berridge, Metropolitan Life Insurance Co., New York; George E. Roberts, vice-president, National City Bank, New York; L. W. Wallace, American Federated Engineering Societies, Washington; Dr. E. Dana Durand, chief, statistical research division, Bureau of Foreign and Domestic Commerce, Washington.

The Rudel-Ryder Machinery Co., Ltd., 159 Bay Street, Toronto, Ont., has been appointed exclusive selling agent for the products of the Geometric Tool Co., New Haven, Conn.

Iron and Steel Markets

No Marked Recession in Sight

Steel Production Well Maintained Although Operations Are Tapering at Pittsburgh—Southern Pig Iron Sellers More Aggressive

SIGNS of a letup in the activity of the iron and steel industry are not lacking, but there is no indication of a recession of customary summer proportions. A further decline has occurred in the consumption of automobile steels, which is now 25 to 35 per cent below the peak rate of May, and the aggressive selling of Alabama pig iron is being felt in a wider area, but steel ingot output as a whole shows little change and foundry melt in the North and East is well maintained.

While steel production in the Pittsburgh district is reported as tapering, operations are holding up in other centers and nothing resembling an appreciable reduction is in sight. Steel Corporation subsidiaries continue to produce at a capacity rate.

The buoyancy of the scrap market, particularly in open-hearth grades, is also an earnest of sustained steel output. Heavy melting grade at Pittsburgh has advanced 25c. a ton to $18.75.

In the pig iron market the broadening scope of Southern competition reflects a decline in Birmingham consumption and a corresponding need for business from other markets. The Alabama subsidiary of the Steel Corporation is shipping against orders for 50,000 tons each from a New Jersey cast iron pipe plant and a Pacific Coast steel works, and has booked 12,000 tons for delivery in Japan.

In eastern Pennsylvania a large consumer has bought a trial tonnage of Southern basic at $19.50, delivered, or 50c. a ton below the price at furnace in that district. In Chicago, Alabama foundry iron is freely offered at $14, Birmingham, and in some instances at $13.50.

The decline in steel specifications from the automobile industry is regarded as temporary, being attributed chiefly to the changing models, and a recovery in releases is expected in about 30 days.

Demand from other consuming lines is active. Pipe lines, which have become a major outlet for steel, have added large tonnages to mill books during the week. The Milwaukee maker of electrically welded pipe will supply 191,000 tons for the longest gas line ever laid, to be built for the Central States Natural Gas Co. from Amarillo, Tex., to Chicago, a distance of 950 miles. The Republic Iron & Steel Co., which recently undertook the making of electric-welded pipe, has taken an order for 200 miles of 6-in. (8000 tons) for the Southwestern Gas Co. A pipe line for Vancouver, B. C., calling for 5000 tons of plates, has been placed with a local fabricator.

Structural steel demand continues at high tide. Computed orders for June, as reported by the Department of Commerce, were 354,200 tons, a total exceeded only once—in March, this year, when returns showed bookings of 358,000 tons. Orders for the first half, at 1,936,500 tons, showed a gain of 23 per cent over the corresponding period in 1928. Awards for the week, at 38,000 tons, were of average proportions, while new inquiries, totaling 34,000 tons, included 13,200 tons for a New York subway section.

Canadian structural work in early prospect is estimated at 100,000 tons, one-half of the total being for the provinces of Ontario and Quebec.

Railroad buying is featured by rail orders of 15,000 tons each, placed by the Pennsylvania and the Northern Pacific. The Nova Scotia mill has been awarded 11,000 tons by the Newfoundland Government. The Wabash has bought 25 large freight locomotives and the Texas & Pacific is in the market for 15. Several large car inquiries are expected from Western roads, among them the Santa Fe, the Union Pacific and the Illinois Central.

Plates, influenced to a large extent by requirements for pipe, are in heavy demand at Chicago, where they accounted for 20 per cent of the mill bookings of the week. This product is also active in other districts. Eastern mills welcome the delay in Governmental approval of contracts for merchant ships and cruisers, preferring to receive the steel specifications when the present pressure for plates has been relieved.

Steels used by the automotive industry are growing easier in price. In sheets the need for new business is becoming more of a factor in the common finishes and the heavier gages. On black sheets 2.85c., Pittsburgh, has become general, 2.95c. having virtually disappeared even as an asking price. Galvanized sheets are being sold rather commonly at 3.60c., Pittsburgh, to consumers and at 3.50c. to jobbers. Sales of heavy gage blue annealed have been made at 2.10c., for No. 10 gage, and in special instances at 2c. Tin mill black plate has been sold at 2.90c., Pittsburgh, a decline of $2 a ton from the recent ruling level.

Sales of steel sheets in the first half of the year, as reported by the independent manufacturers, averaged 380,000 tons a month, or 25 per cent above the average of the corresponding period in 1928. Shipments amounted to 362,000 tons a month, 14½ per cent better than last year. Production kept pace with shipments, averaging 365,000 tons a month.

Both of THE IRON AGE composite prices are unchanged, pig iron at $18.42 a gross ton and steel at 2.412c. a lb.

A Comparison of Prices

Market Prices at Date, and One Week, One Month and One Year Previous, Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron, Per Gross Ton:	July 23, 1929	July 16, 1929	June 25, 1929	July 24, 1928
No. 2 fdy., Philadelphia	$21.76	$21.76	$21.76	$20.26
No. 2, Valley furnace	18.50	18.50	18.50	16.50
No. 2 Southern, Cin'ti	17.69	17.69	18.69	19.19
No. 2, Birmingham	14.50	14.50	15.00	15.50
No. 2 foundry, Chicago*	20.00	20.00	20.00	17.50
Basic, del'd eastern Pa.	20.25	20.25	20.25	19.00
Basic, Valley furnace	18.50	18.50	18.50	16.00
Valley Bessemer, del'd P'gh	20.76	20.76	20.76	18.76
Malleable, Chicago*	20.00	20.00	20.00	17.50
Malleable, Valley	19.00	19.00	19.00	17.00
Gray forge, Pittsburgh	19.76	19.76	19.76	18.01
L. S. charcoal, Chicago	27.04	27.04	27.04	27.04
Ferromanganese, furnace	105.00	105.00	105.00	105.00
Rails, Billets, etc., Per Gross Ton:				
Rails, heavy, at mill	$43.00	$43.00	$43.00	$43.00
Light rails at mill	36.00	36.00	36.00	36.00
Rerolling billets, Pittsburgh	35.00	35.00	34.00	32.00
Sheet bars, Pittsburgh	35.00	35.00	35.00	32.00
Slabs, Pittsburgh	35.00	35.00	35.00	32.00
Forging billets, Pittsburgh	40.00	40.00	39.00	38.00
Wire rods, Pittsburgh	42.00	42.00	42.00	42.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.85	1.85	1.85	1.85
Finished Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Bars, Pittsburgh	1.95	1.95	1.95	1.85
Bars, Chicago	2.05	2.05	2.05	2.00
Bars, Cleveland	1.95	1.95	1.95	1.85
Bars, New York	2.29	2.29	2.29	2.19
Tank plates, Pittsburgh	1.95	1.95	1.95	1.85
Tank plates, Chicago	2.05	2.05	2.05	2.00
Tank plates, New York	2.22½	2.22½	2.22½	2.17½
Structural shapes, Pittsburgh	1.95	1.95	1.95	1.85
Structural shapes, Chicago	2.05	2.05	2.05	2.00
Structural shapes, New York	2.19½	2.19½	2.19½	2.14½
Cold-finished bars, Pittsburgh	2.30	2.30	2.30	2.10
Hot-rolled strips, Pittsburgh	1.90	1.90	1.90	1.75
Cold-rolled strips, Pittsburgh	2.75	2.75	2.75	2.90

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

Finished Steel,	July 23, 1929	July 16, 1929	June 25, 1929	July 24, 1928
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 24, P'gh	2.85	2.85	2.85	2.60
Sheets, black, No. 24, Chicago dist. mill	3.05	3.05	3.05	2.75
Sheets, galv., No. 24, P'gh	3.60	3.60	3.60	3.40
Sheets, galv., No. 24, Chicago dist. mill	3.80	3.80	3.80	3.60
Sheets, blue, No. 13, P'gh	2.35	2.35	2.35	2.10
Sheets, blue, No. 13, Chicago dist. mill	2.45	2.45	2.45	2.20
Wire nails, Pittsburgh	2.65	2.65	2.65	2.55
Wire nails, Chicago dist mill	2.70	2.70	2.70	2.60
Plain wire, Pittsburgh	2.50	2.50	2.50	2.40
Plain wire, Chicago dist. mill	2.55	2.55	2.55	2.45
Barbed wire, galv., P'gh	3.30	3.30	3.30	3.20
Barbed wire, galv., Chicago dist. mill	3.35	3.35	3.35	3.25
Tin plate, 100 lb. box, P'gh	$5.35	$5.35	$5.35	$5.25
Old Material, Per Gross Ton:				
Heavy melting steel, P'gh	$18.75	$18.50	$18.25	$14.25
Heavy melting steel, Phila	16.50	16.50	16.00	13.00
Heavy melting steel, Ch'go	14.75	14.75	14.75	12.25
Carwheels, Chicago	14.00	14.00	14.00	12.75
Carwheels, Philadelphia	16.50	16.50	16.00	15.50
No. 1 cast, Pittsburgh	15.50	15.50	15.50	14.25
No. 1 cast, Philadelphia	16.50	16.50	16.50	15.50
No. 1 cast, Ch'go (net ton)	14.50	14.50	14.50	13.50
No. 1 RR. wrot., Phila	16.00	16.00	16.00	13.50
No. 1 RR. wrot., Ch'go (net)	13.50	13.50	13.50	10.75
Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	$2.75	$2.75	$2.75	$2.60
Foundry coke, prompt	3.75	3.75	3.75	3.75
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	18.12½	18.12½	18.12½	14.75
Electrolytic copper, refinery	17.75	17.75	17.75	14.50
Tin (Straits), New York	47.25	47.25	44.25	48.00
Zinc, East St. Louis	6.80	6.70	6.70	6.20
Zinc, New York	7.15	7.05	7.05	6.55
Lead, St. Louis	6.55	6.55	6.80	6.00
Lead, New York	6.75	6.75	7.00	6.20
Antimony (Asiatic), N. Y.	8.75	8.25	8.75	9.37½

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Pittsburgh

Less Tension in Production—Sheet Still Behind in Deliveries but Prices Are Weak

PITTSBURGH, July 23.—Two or three companies in this district have taken out open-hearth furnaces in the last week. Although the need for repairs is held responsible for this curtailment in one of the cases, steel production in the Pittsburgh district is beginning to taper. The larger companies, in the face of declining specifications in many products, are no longer pushing their steel capacity to the limit. The condition is reflected in slightly lighter shipments of ferroalloys and furnace coke, as well as in a generally easier condition in the semi-finished steel market, the supply of this commodity now being fully equal to the requirements of all the large companies.

The present month is expected to show a slight decline in shipments of nearly all products, probable exceptions being wire and plates. Had it not been for the hot weather early in the month, sheet production would likely have been equal to June, as sheet mills are still behind in deliveries and have enough business on their books for four to six weeks operations.

Backlogs on bars and shapes have declined materially and strip steel and cold-finished steel bars are now being moved in the two or three weeks usually required for rolling.

Makers of lapweld pipe in the larger sizes are preparing to quote on several large projects, and with present operations at a fairly high rate, the second half of the year is expected to prove more profitable than the first.

Sheet prices have shown additional weakness and the maximum quotations of 2.85c. and 3.70c., Pittsburgh, on black and galvanized sheets, respectively, are no longer applying on any important tonnage. The general market has settled to prices $2 under the above figures with galvanized sheets now being commonly sold to jobbers at 3.50c. On blue annealed light plates, the product of continuous strip mills are being sold at 2.10c and even less, although makers of blue annealed sheets operating jobbing mills are holding to 2.20c. Tin mill black plate has been sold by several producers for 2.90c., Pittsburgh, a concession of $2 a ton from recent levels. The higher asking price on cold-rolled strip steel is no longer effective and one or two cases of shading the 2.75c. quotation are reported.

The pig iron and coke markets are quiet. A steel company in this district is reported to have bought a substantial tonnage of basic iron in the last week, but the price was not disclosed. Other sales are of small tonnage, but the aggregate is fairly satisfactory. The scrap market is stronger and No. 1 heavy melting steel is now quotable at $18.50 to $19.

Pig Iron.—Activity is still confined largely to small fill-in orders, although one large sale of basic pig iron to a non-integrated steel company in this district is reported. The Westinghouse Electric & Mfg. Co. has placed the second-half requirements of its Trafford City plant with at least three

producers. The price on the foundry grade was $20.01 delivered. This figures back to $19, Pittsburgh local furnace, and represents a slight concession made by the Valley makers who shared in the business. However, the Valley prices of $18.50 for foundry and basic iron, and $19 for malleable and Bessemer are being strictly adhered to in small sales in the immediate Valley district and other points at which the Pittsburgh furnace does not have a freight rate advantage. Shipments against contracts are steady but not of large proportions. A number of consumers are said to have placed small tonnages recently to tide them over the summer months, as they have sufficient iron on previous contracts to keep them from going into the market at this time for any considerable tonnage. The Standard Sanitary Mfg. Co. has issued one or two small inquiries for supplementary tonnages at its Pittsburgh district plants, and may not enter the market for any substantial tonnage at this time. This method of buying in small lots has probably added strength to the market, as furnaces are not inclined to accept lower prices except to build up substantial backlogs. Furnace stocks are not accumulating and many makers are not now prepared to quote on large tonnages for delivery in the immediate future. The Claire furnace of the Davison Coke & Iron Co. was blown out on July 23 for relining and the same company's Cherry Valley stack is expected to go in during the first week of August.

Prices per gross ton, f.o.b. Valley furnace:

Basic	$18.50
Bessemer	19.00
Gray forge	18.00
No. 2 foundry	18.50
No. 3 foundry	18.00
Malleable	19.00
Low phos., copper free	27.00

Freight rate to Pittsburgh or Cleveland district, $1.76.

Prices per gross ton, f.o.b. Pittsburgh district furnace:

Basic	$19.00
No. 2 foundry	19.00
No. 3 foundry	18.50
Malleable	19.50

Freight rates to points in Pittsburgh district range from 63c. to $1.13.

Semi-Finished Steel.—The supply of crude steel in this and nearby districts is now of about normal proportions, although open-hearth production must be maintained at a very high rate to maintain this situation. Two or three companies in the district have put out furnaces in the last week, but not because stocks are accumulating. Integrated steel makers who normally have a small surplus of semi-finished steel for sale in the open market have nothing to offer at this time. Several large buyers of billets and slabs have not yet contracted for their third quarter requirements and the price situation is unchanged, with producers holding to $35, Pittsburgh or Youngstown, and buyers refusing to pay more than $34. On sheet bars the price is well established at $35, with a few companies asking $36 on spot tonnage. Very little business has been taken at the latter figure. Wire rods are steady at $42, Pittsburgh or Cleveland, and shipments against contracts are high for this time of the year.

Bars, Shapes and Plates.—Tonnage releases are still ahead of expectations, but some makers report a slight decline as compared with the previous month. Mills are having considerable difficulty satisfying customers on plate shipments, although the situation has eased off slightly in the last month. It is still difficult to get deliveries in less than six weeks and one large maker has enough business booked to assure capacity operation for at least two months. Demand from barge builders and railroad equipment makers is responsible to a large extent for this situation, but there is a satisfactory movement into other consuming channels. Bars are moving well, with delivery promises averaging from three to four weeks. Reinforcing steel is accounting for a large tonnage and there is a steady demand from screw machine product makers and cold-finishing mills. Agricultural implement makers served by Pittsburgh companies have not curtailed their steel requirements. Shapes are the least active of the heavy hot-rolled products. However, the larger fabricating shops in the district are well occupied and the volume of pending business is satisfactory for this time of the year. Plates are holding firmly at 1.95c., Pittsburgh, while there are occasional concessions of $1 a ton on shapes and bars.

Wire Products.—Demand for manufacturers' wire is fully equal to that of June, but shipments of fencing, barbed wire and other products going to the farms have fallen off slightly. In the aggregate the wire business is considerably ahead of last year and prospects are encouraging. The nail market is characteristically quiet, and continued price weakness is reported in outlying territory, where quoting on a mill base is more common than naming a Pittsburgh base. Pittsburgh mills are meeting this competition in some instances, but have not had to go below 2.65c. per lb., Pittsburgh, in territory east of here. The 2.75c. price also applies on a limited amount of business. On wire no deviations from 2.50c. to 2.60c., Pittsburgh or Cleveland, are reported.

Tubular Goods.—Mills in the Pittsburgh and Youngstown districts are very optimistic over the prospective line pipe business and are prepared to quote on several of the large projects now being considered. Lap-weld and seamless mills are operating at about 60 per cent on an average, although this figure is based on considerable capacity that will probably not be utilized again in the manufacture of pipe. Demand for standard pipe is steady, but not active, while shipments of mechanical and boiler tubing are holding up well.

Sheets.—Shipments of sheets during July will probably show a slight decline as compared with June, but they may be close to record proportions for this month. Some curtailment in production in July has been occasioned by the hot weather, but this was not a factor during the last week and the leading interest operated its mills at about 98 per cent of capacity. The greater part of the falling off in demand may be traced to curtailment in the operations of makers of medium-priced automobiles, as demand from other consuming industries has not declined appreciably. Makers of electrical refrigerators are still requiring large tonnages of sheets and the radio industry is growing in importance as a user. Prices are not

THE IRON AGE Composite Prices

Finished Steel

July 23, 1929, 2.412c. a Lb.

One week ago	2.412c.
One month ago	2.412c.
One year ago	2.319c.
10-year pre-war average	1.689c.

Based on steel bars, beams, tank plates, wire, rails, black pipe and black sheets. These products make 87 per cent of the United States output of finished steel.

	High		Low	
1929	2.412c.,	April 2;	2.391c.,	Jan. 8
1928	2.391c.,	Dec. 11;	2.314c.,	Jan. 3
1927	2.453c.,	Jan. 4;	2.293c.,	Oct. 25
1926	2.453c.,	Jan. 5;	2.403c.,	May 18
1925	2.560c.,	Jan. 6;	2.396c.,	Aug. 18

Pig Iron

July 23, 1929, $18.42 a Gross Ton

One week ago	$18.42
One month ago	18.63
One year ago	17.04
10-year pre-war average	15.72

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	High		Low	
1929	$18.71,	May 14;	$18.29,	March 19
1928	18.59,	Nov. 27;	17.04,	July 24
1927	19.71,	Jan. 4;	17.54,	Nov. 1
1926	21.54,	Jan. 5;	19.46,	July 13
1925	22.50,	Jan. 13;	18.96,	July 7

Mill Prices of Finished Iron and Steel Products

Iron and Steel Bars

Soft Steel

	Base per Lb.
F.o.b. Pittsburgh mill	1.95c.
F.o.b. Chicago	2.05c.
Del'd Philadelphia	2.27c.
Del'd New York	2.29c.
Del'd Cleveland	1.92½c. to 1.95c.
F.o.b. Cleveland	1.90c. to 1.95c.
F.o.b. Lackawanna	2.05c.
F.o.b. Birmingham	2.15c.
C.i.f. Pacific ports	2.35c.
F.o.b. San Francisco mills	2.35c. to 2.40c.

Billet Steel Reinforcing

F.o.b. Pittsburgh mills, 40, 50, 60-ft.	2.05c.
F.o.b. Pittsburgh mills, cut lengths	2.30c.
F.o.b. Birmingham, mill lengths	2.15c.

Rail Steel

F.o.b. mills, east of Chicago dist.	1.85c. to 1.90c.
F.o.b. Chicago Heights mill	1.95c.
Del'd Philadelphia	2.27c.

Iron

Common iron, f.o.b. Chicago	2.05c.
Refined iron, f.o.b. P'gh mills	2.75c.
Common iron, del'd Philadelphia	2.12c.
Common iron, del'd New York	2.14c.

Tank Plates

	Base per Lb.
F.o.b. Pittsburgh mill	1.95c.
F.o.b. Chicago	2.05c.
F.o.b. Birmingham	2.15c.
Del'd Cleveland	2.14c.
Del'd Philadelphia	2.15c.
F.o.b. Coatesville	2.05c.
F.o.b. Sparrow Point	2.05c.
F.o.b. Lackawanna	2.05c.
Del'd New York	2.22½c.
C.i.f. Pacific ports	2.35c.

Structural Shapes

	Base per Lb.
F.o.b. Pittsburgh mill	1.95c.
F.o.b. Chicago	2.05c.
F.o.b. Birmingham	2.15c.
F.o.b. Lackawanna	2.05c.
F.o.b. Bethlehem	2.05c.
Del'd Cleveland	2.14c.
Del'd Philadelphia	2.01c. to 2.06c.
Del'd New York	2.14½c.
C.i.f. Pacific ports	2.35c.

Hot-Rolled Hoops, Bands and Strips

	Base per Lb.
6 in. and narrower, P'gh	2.00c.
Wider than 6 in., P'gh	1.90c.
6 in. and narrower, Chicago	2.20c.
Wider than 6 in., Chicago	2.10c.
Cooperage stock, P'gh	2.20c.
Cooperage stock, Chicago	2.30c.

Cold-Finished Steel

	Base per Lb.
Bars, f.o.b. Pittsburgh mill	2.30c.
Bars, f.o.b. Chicago	2.30c.
Bars, Cleveland	2.35c.
Shafting, ground, f.o.b. mill	*2.65c. to 3.60c.
Strips, P'gh	2.75c.
Strips, Cleveland	2.75c.
Strips, del'd Chicago	3.05c. to 3.15c.
Strips, Worcester	2.90c. to 3.00c.
Fender stock, No. 20 gage, Pittsburgh or Cleveland	4.25c.

*According to size.

Wire Products

(Carload lots, f.o.b. Pittsburgh and Cleveland, to jobbers and retailers.)

	Base per Keg
Wire nails	$2.65 to $2.75
Galvanized nails	4.65 to 4.75
Galvanized staples	3.35 to 3.45
Polished staples	3.10 to 3.20
Cement coated nails	2.65 to 2.75

	Base per 100 Lb.
Bright plain wire, No. 6 to No. 9 gage	$2.50 to $2.60
Annealed fence wire	2.65 to 2.75
Spring wire	3.50 to 3.60
Galv'd wire, No. 9	3.10 to 3.20
Barbed wire, galv'd	3.30 to 3.40
Barbed wire, painted	3.05 to 3.15
Woven wire fence (per net ton to retailers)	65.00

Chicago district mill and delivered Chicago prices are $1 per ton above the foregoing. Birmingham mill prices $3 a ton higher; Worcester, Mass. (wire), mill $3 a ton higher on production of that plant; Duluth, Minn., mill $2 a ton higher; Anderson, Ind., $1 higher.

Cut Nails

	Per 100 Lb.
Carloads, Wheeling, Reading or Northumberland, Pa.	$2.70
Less carloads, Wheeling or Reading	2.80

Light Plates

No. 10, blue annealed, f.o.b. P'gh.	2.10c. to 2.20c.
No. 10, blue annealed, f.o.b. Chicago dist.	2.30c.
No. 10, blue annealed, del'd Phila.	2.42c. to 2.52c.
No. 10, blue annealed, B'ham	2.35c.

Sheets

Blue Annealed

	Base per Lb.
No. 13, f.o.b. P'gh	2.25c. to 2.35c.
No. 13, f.o.b. Chicago dist.	2.45c.
No. 13, del'd Philadelphia	2.67c.
No. 13, blue annealed, B'ham	2.50c.

Box Annealed, One Pass Cold Rolled

No. 24, f.o.b. Pittsburgh	2.85c.
No. 24, f.o.b. Chicago dist. mill	3.05c.
No. 24, del'd Philadelphia	3.17c. to 3.27c.
No. 24, f.o.b. Birmingham	3.00c. to 3.10c.

Metal Furniture Sheets

No. 24, f.o.b. P'gh	4.10c. to 4.20c.

Galvanized

No. 24, f.o.b. Pittsburgh	3.50c. to 3.60c.
No. 24, f.o.b. Chicago dist. mill	3.80c.
No. 24, del'd Cleveland	3.69c. to 3.79c.
No. 24, del'd Philadelphia	3.92c. to 4.02c.
No. 24, f.o.b. Birmingham	3.75c. to 3.85c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	2.90c. to 3.00c.
No. 28, f.o.b. Chicago dist. mill	3.10c.

Automobile Body Sheets

No. 28, f.o.b. Pittsburgh	4.10c.

Long Ternes

No. 24, 8-lb. coating, f.o.b. mill	4.00c.

Vitreous Enameling Stock

No. 24, f.o.b. Pittsburgh	3.90c.

Tin Plate

	Per Base Box
Standard cokes, f.o.b. P'gh district mills	$5.35
Standard cokes, f.o.b. Gary	5.45

Terne Plate

(*F.o.b. Morgantown or Pittsburgh*)
(Per Package, 20 x 28 in.)

8-lb. coating I.C.	$11.20
15-lb. coating I.C.	14.00
20-lb. coating I.C.	15.30
25-lb. coating I.C.	$16.70
30-lb. coating I.C.	17.75
40-lb. coating I.C.	19.85

Alloy Steel Bars

(F.o.b. makers' mill)

Alloy Quality Bar Base, 2.65c. to 2.75c. per Lb.

S.A.E. Series Numbers		Alloy Differential
2000	(½% Nickel)	0.25
2100	(1½% Nickel)	0.55
2300	(3½% Nickel)	1.50
2500	(5% Nickel)	2.25
3100	Nickel Chromium	0.55
3200	Nickel Chromium	1.35
3300	Nickel Chromium	3.80
3400	Nickel Chromium	3.20
4100	Chromium Molybdenum (0.15 to 0.25 Molybdenum)	0.50
4100	Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600	Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.25 to 1.75 Nickel)	1.05
5100	Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100	Chromium Steel (0.80 to 1.10 Chromium)	0.45
5100	Chromium Spring Steel	0.20
6100	Chromium Vanadium Bars	1.20
6100	Chromium Vanadium Spring Steel	0.95
9250	Silicon Manganese Spring Steel (flats)	0.25
	Rounds and squares	0.50
	Chromium Nickel Vanadium	1.50
	Carbon Vanadium	0.95

Above prices are for hot rolled steel bars, forging quality. The ordinary differential for cold-drawn bars is ¾c. per lb. higher. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis.

Billets under 4 x 4 in. carry the steel bar base. Slabs with a sectional area of 16 in. or over carry the billet price. Slabs with sectional area of less than 16 in. or less than 2½ in. thick, regardless of sectional area, take the bar price.

Rails

	Per Gross Ton
Standard, f.o.b. mill	$43.00
Light (from billets), f.o.b. mill	36.00
Light (from rail steel), f.o.b. mill	34.00
Light (from billets), f.o.b. Ch'go mill	36.00

Track Equipment

	Base per 100 Lb.
Spikes, ⅝ in. and larger	$2.80
Spikes, ½ in. and smaller	2.80
Spikes, boat and barge	3.00
Tie plate, steel	2.15
Angle bars	$2.75
Track bolts, to steam railroads	$3.80 to 4.00
Track bolts, to jobbers, all sizes, per 100 count	70 per cent off list

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛	45	19½	¼ and ⅜	+11	+36
¼ to ⅜	51	25½	½	23	5
½	56	42½	¾	28	11
¾	60	48½	1 and 1¼	31	15
1 to 3	62	50½	1½ and 2	35	18

Lap Weld

2	55	43½	2	23	9
2½ to 6	59	47½	2½ to 3½	28	13
7 and 8	56	43½	4 to 6	30	17
9 and 10	54	42½	7 and 8	29	16
11 and 12	53	40½	9 to 12	26	11

Butt Weld, extra strong, plain ends

⅛	41	24½	¼ and ⅜	+13	+48
¼ to ⅜	47	30½	½	23	7
½	53	42½	¾	28	12
¾	58	47½	1 to 2	34	18
1 to 1½	60	49½			
2 to 3	61	50½			

Lap Weld, extra strong, plain ends

2	53	42½	½	29	13
2½ to 4	57	46½	2½ to 4	34	20
4½ to 6	56	45½	4½ to 6	33	19
7 to 8	52	39½	7 and 8	31	17
9 and 10	45	32½	9 to 12	21	8
11 and 12	44	31½			

On carloads the above discounts on steel pipe are increased on block by one point, with supplementary discount of 5%, and on galvanized by 1½ points, with supplementary discount of 5%. On iron pipe, both black and galvanized, the above discounts are increased to jobbers by one point with supplementary discounts of 5 and 2½%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Steel		Charcoal Iron	
2 in. and 2¼ in.	40	1½ in.	1
2½ in.—2¾ in.	48	1¾ in.	8
3 in.	54	2 in.—2¼ in.	13
3¼ in.—3¾ in.	56	2½ in.—2¾ in.	16
4 in.	59	3 in.	17
4½ in. to 6 in.	48	3¼ in. to 3½ in.	18
		4 in.	20
		4½ in.	21

On lots of a carload or more, the above base discounts are subject to a preferential of two fives on steel and of 10 per cent on charcoal iron tubes. Smaller quantities are subject to the following modifications from the base discounts:

Lap Welded Steel—Under 10,000 lb., 6 points under base and one five; 10,000 lb. to carload, 4 points under base and two fives. Charcoal Iron—Under 10,000 lb., 2 points under base; 10,000 lb. to carload, base and one five.

Standard Commercial Seamless Boiler Tubes

Cold Drawn

1 in.	63	3 in.	48
1¼ to 1½ in.	55	3¼ to 3½ in.	50
1¾ in.	39	4 in.	53
2 to 2¼ in.	34	4½, 5 and 6 in.	42
2½ to 2¾ in.	42		

Hot Rolled

2 and 2¼ in.	40	3¼ to 3½ in.	56
2½ and 2¾ in.	48	4 in.	59
3 in.	54	4½, 5 and 6 in.	48

Beyond the above base discounts a preferential discount of 5 per cent is allowed on carload lots. On less than carloads to 10,000 lb. base discounts are reduced 4 points with 5 per cent preferential; on less than 10,000 lb., base discounts are reduced 6 points, with no preferential. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage take mechanical tube list and discounts. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

	Per Cent Off List
Carbon, 0.10% to 0.30%, base (carloads)	55
Carbon, 0.30% to 0.40%, base	50

Plus differentials for lengths over 18 ft. and for commercial exact lengths. Warehouse discounts on small lots are less than the above.

what they should be, considering the heavy backlogs of most of the large producers. The 3.70c. and 2.95c., Pittsburgh, quotations on galvanized and black sheets respectively are now applying on scarcely any business and, although these figures are still quoted, the market has settled to 2.85c. on black sheets and 3.60c. on galvanized. Jobbers are having little difficulty in placing business at the $2 concession usually offered them on galvanized sheets. Automobile companies are said to be able to buy black sheets at 2.75c., base, but, as this business cannot be classified as one-pass material on which the price is usually based, it is not representative of the market. High differentials for pickling and other treatment enable manufacturers to secure an adequate profit on this business which they would not be able to get on the ordinary one-pass product. Large makers in this territory are holding firmly to the 2.20c. and 2.35c., Pittsburgh, quotations on light plates and blue annealed sheets and are making no effort to compete with wide strips, which are sold at lower prices. Weakness has developed on tin mill black plate, which is now quotable at 2.90c. to 3c., Pittsburgh.

Tin Plate. — Demand continues rather steady and specifications for September tonnages from the container manufacturers have been satisfactory. In some cases mills will begin rolling this tonnage some time next week, as present backlogs are not sufficient to maintain the present rate of operations for any length of time. Mills in the district are well over a 90 per cent rate in operations and will continue these schedules for several weeks unless current demand declines suddenly.

Strip Steel.—Some makers of strip steel report heavier tonnage releases thus far in July than were received during the corresponding June period, but demand is rather spotty for both the hot and cold-rolled material. Makers who depend for the bulk of their tonnage on the manufacturers of medium-priced automobiles have been forced to curtail operations somewhat since the first of the month, but a fairly well diversified demand continues from other miscellaneous users of strips. Deliveries are no longer extended for more than two or three weeks except in isolated cases where mill facilities are largely responsible. On hot-rolled strip, prices are well established at 2c., Pittsburgh, for 6-in. and narrower, and 1.90c. for the wider sizes. Concessions of $1 to $2 a ton from the 2.75c., Pittsburgh; price on cold-rolled strip have been reported, but, so far as can be determined, this shading has always occurred under conditions that could not be said to govern the market. Makers generally have refused to meet quotations below 2.75c., although the 2.85c. price, formerly quoted on small-lot business, is gradually disappearing.

Cold-Finished Steel Bars.—Revision of extras on cold-finished steel bars, the details of which will be found elsewhere in this issue, results in slight price reductions when applied to the list as a whole. The new prices will not apply on third quarter tonnage, which is largely covered by contract. July business is holding up to June levels, but operations are largely on a week-to-week basis. Improvement in demand from the automobile industry is expected in a short time, but present specifications do not reflect this tendency. The price of 2.30c., Pittsburgh, is being well maintained.

Bolts, Nuts and Rivets.—Operations have declined slightly from the high rate of the spring months, but the industry as a whole is still running at 60 to 65 per cent of theoretical capacity, an unusually high level for this time of the year. Demand is well diversified, with railroad car builders taking a large tonnage and jobbers steadily requiring shipments. Price conditions are encouraging, with bolts and nuts unchanged at 70 per cent off list and large rivets holding at $3.10 per 100 lb., Pittsburgh or Cleveland.

Coal and Coke.—The furnace coke market shows little change from the previous week, with demand rather quiet and production somewhat higher than the present requirements of the consuming industry. Prices are unchanged at $2.75 to $2.85 a net ton, Connellsville, although producers are asking slightly higher figures on future tonnage in expectation of a stronger demand. On the foundry grade, both shipments and new business are at a low point and the situation is reflected in price uncertainty on all except the premium brands of coke, which are firm at $4.85, ovens. Coal production is holding up fairly well for this time of the year, but no price recovery is expected before fall.

Old Material.—The scrap market has developed further strength in the last week, and No. 1 heavy melting steel is now quotable at $18.50 to $19, the average being an advance of 25c. Although heavy melting steel is offered at some points at $18.75, mills would have difficulty in purchasing any quantity of first quality steel at that figure. One mill in the district which accepts car sides as No. 1 steel paid $18 for a considerable tonnage, and as other consumers will not take car sides at less than $1 a ton under the No. 1 grade, this purchase also bears out the strength of the market. Hydraulic compressed sheets are theoretically stronger but no sales at higher than $18.50, which might justify an advance of 25c. a ton, have been reported. Blast furnace borings and turnings have been sold at $12.75 and $13, and grades of steel which ordinarily reflect the strength of the No. 1 heavy melting grade have gained strength along with it. Rejections are frequent at all points in the district, and the scarcity of high grade No. 1 steel is probably responsible for the general strength of the market. However, with the large consumers nearly all taking scrap in undiminished quantities, and at a rate considerably higher than is usual at this time of the year, a strong market situation is not unexpected. It is freely believed that any marked recession in steel operations would be reflected immediately in the scrap market. And uncertainty on this point has resulted in a cautious attitude on the part of both buyers and sellers of scrap.

Prices per gross ton delivered consumers' yards in Pittsburgh and points taking the Pittsburgh district freight rate:

Basic Open-Hearth Grades:	
No. 1 heavy melting steel	$18.50 to $19.00
No. 2 heavy melting steel	16.50 to 17.00
Scrap rails	18.00 to 18.50
Compressed sheet steel	18.00 to 18.50
Bundled sheets, sides and ends	17.00 to 17.50
Cast iron carwheels	16.50 to 17.00
Sheet bar crops, ordinary	19.50 to 20.00
Heavy breakable cast	13.00 to 13.50
No. 2 railroad wrought	18.50 to 19.00
Hvy. steel axle turnings	16.25 to 16.75
Machine shop turnings	12.00 to 12.50
Acid Open-Hearth Grades:	
Railr. knuckles and couplers	21.50 to 22.00
Railr. coil and leaf springs	21.50 to 22.00
Rolled steel wheels	21.50 to 22.00
Low phos. billet and bloom ends	22.50 to 23.00
Low phos., mill plates	22.50 to 23.00
Low phos., light grades	20.50 to 21.50
Low phos., sheet bar crops	20.50 to 21.50
Heavy steel axle turnings	16.25 to 16.75
Electric Furnace Grades:	
Low phos., punchings	20.00 to 21.00
Hvy. steel axle turnings	16.25 to 16.75
Blast Furnace Grades:	
Short shoveling steel turnings	12.50 to 13.00
Short mixed borings and turnings	12.50 to 13.00
Cast iron borings	12.50 to 13.00
Rolling Mill Grades:	
Steel car axles	21.50 to 22.00
Cupola Grades:	
No. 1 cast	15.00 to 16.00
Rails 3 ft. and under	20.00 to 21.00

Warehouse Prices, f.o.b. Pittsburgh

	Base per Lb.
Plates	3.00c.
Structural shapes	3.00c.
Soft steel bars and small shapes	2.90c.
Reinforcing steel bars	2.75c.
Cold-finished and screw stock—	
Rounds and hexagons	3.60c.
Squares and flats	4.10c.
Bands	3.25c.
Hoops	4.25c.
Black sheets (No. 24), 25 or more bundles	3.80c.
Galv. sheets (No. 24), 25 or more bundles	4.55c.
Blue ann'l'd sheets (No. 10), 1 to 10 sheets	3.45c.
Galv. corrug. sheets (No. 28), per square	$4.43
Spikes, large	3.40c.
Small	3.80c. to 5.25c.
Boat	3.80c.
Track bolts, all sizes, per 100 count,	60 per cent off list
Machine bolts, 100 count,	60 per cent off list
Carriage bolts, 100 count,	60 per cent off list
Nuts, all styles, 100 count,	60 per cent off list
Large rivets, base per 100 lb.	$3.50
Wire, black soft ann'l'd, base per 100 lb.	$3.00 to 3.10
Wire, galv. soft, base per 100 lb.	3.00 to 3.10
Common wire nails, per keg	3.00
Cement coated nails, per keg	3.05

Industrial Plants Corporation, 25 Church Street, New York, has been appointed auctioneer to sell at public auction all of the physical assets of the Wildman Tire & Rubber Co., Port Clinton, Ohio, consisting of land, buildings, machinery, etc.

Semi-Finished Steel, Raw Materials, Bolts and Rivets

Mill Prices of Semi-Finished Steel

Billets and Blooms

	Per Gross Ton
Rerolling, 4 in. and under 10 in., Pittsburgh	$35.00
Rerolling, 4 in. and under 10 in., Youngstown	35.00
Rerolling, 4 in. and under 10 in., Cleveland	35.00
Rerolling, 4 in. and under 10 in., Chicago	37.00
Forging quality, Pittsburgh	$40.00 to 41.00

Sheet Bars

(Open Hearth or Bessemer)

	Per Gross Ton
Pittsburgh	$35.00
Youngstown	35.00
Cleveland	35.00

Slabs

(8 in. x 2 in. and under 10 in. x 10 in.)

	Per Gross Ton
Pittsburgh	$35.00
Youngstown	35.00
Cleveland	35.00

Skelp

(F.o.b. Pittsburgh or Youngstown)

	Per Lb.
Grooved	1.85c. to 1.90c.
Universal	1.85c. to 1.90c.
Sheared	1.85c. to 1.90c.

Wire Rods

(Common soft, base)

	Per Gross Ton
Pittsburgh	$42.00
Cleveland	42.00
Chicago	43.00

Prices of Raw Material

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.50% iron	$4.80
Old range non-Bessemer, 51.50% iron	4.65
Mesabi Bessemer, 51.50% iron	4.65
Mesabi non-Bessemer, 51.50% iron	4.50
High phosphorus, 51.50% iron	4.40

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algerian	10.00c.
Iron ore, low phos., Swedish, average 68% iron	10.00c.
Iron ore, basis Swedish, average 65% iron	9.00c.
Manganese ore, washed, 52% manganese, from the Caucasus	33.00c. to 35.00c.
Manganese ore, Brazilian, African or Indian, basic 50%	33.00c. to 35.00c.
Tungsten ore, high grade, per unit, in 60% concentrates	$15.00 to $15.50
	Per Gross Ton
Chrome ore, 45 to 50% Cr_2O_3, crude, c.i.f. Atlantic seaboard	$22.00 to $24.00
	Per Lb.
Molybdenum ore, 85% concentrates of MoS_2, delivered	50c. to 55c.

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville prompt	$2.75 to $2.85
Foundry, f.o.b. Connellsville prompt	3.75 to 4.85
Foundry, by-product, Ch'go ovens	8.00
Foundry, by-product, New England, del'd	11.00
Foundry, by-product, Newark or Jersey City, del'vered	9.00 to 9.40
Foundry, by-product, Phila.	9.00
Foundry, Birmingham	5.00
Foundry, by-product, St. Louis, f.o.b. ovens	8.00
Foundry by-prod., del'd St. Louis	9.00

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	$1.25 to $1.75
Mine run coking coal, f.o.b. W. Pa. mines	1.50 to 1.75
Gas coal, ¾-in. f.o.b. Pa. mines	1.90 to 2.00
Mine run gas coal, f.o.b. Pa. mines	1.65 to 1.75
Steam slack, f.o.b. W. Pa. mines	80c. to 90c.
Gas slack, f.o.b. W. Pa. mines	1.00 to 1.10

Ferromanganese

	Per Gross Ton
Domestic, 80%, seaboard	$105.00
Foreign, 80%, Atlantic or Gulf port, duty paid	105.00

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	$31.00 to $34.00
Domestic, 16 to 19%	29.00 to 32.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50%	$83.50
75%	130.00

	Per Gross Ton Furnace		Per Gross Ton Furnace
10%	$35.00	12%	$39.00
11%	37.00	14 to 16%	45.00

Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio, Furnace

	Per Gross Ton		Per Gross Ton
10%	$30.00	12%	$34.00
11%	32.00		

Silvery Iron

F.o.b. Jackson County, Ohio, Furnace

	Per Gross Ton		Per Gross Ton
6%	$23.00	10%	$27.00 to $28.00
7%	24.00	11%	29.00 to 30.00
8%	25.00	12%	31.00 to 32.00
9%	26.00		

Other Ferroalloys

Ferrotungsten, per lb., contained metal del'd	$1.40 to $1.50
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. deliv-ered, in carloads	11.00c.
Ferrovanadium, per lb. contained vanadium, f.o.b. furnace	$3.15 to $3.65
Ferrocarbontitanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads	$160.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per gross ton	$91.00
Ferrophosphorus, electric 24%, f.o.b. Anniston, Ala., per gross ton	$122.50

Fluxes and Refractories

Fluorspar

	Per Net Ton
Domestic, 85% and over calcium fluoride, not over 5% silicon, gravel, f.o.b. Illinois and Kentucky mines	$18.00
No. 2 lump, Illinois and Kentucky mines	20.00
Foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Atlantic port, duty paid	$18.00 to $18.50
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silica, f.o.b. Illinois and Kentucky mines	32.50

Fire Clay Brick

	Per 1000 f.o.b. Works	
	High-Heat Duty Brick	Intermediate Heavy Duty Brick
Pennsylvania	$43.00 to $46.00	$35.00 to $38.00
Maryland	43.00 to 46.00	35.00 to 38.00
New Jersey	50.00 to 65.00	.....
Ohio	43.00 to 46.00	35.00 to 38.00
Kentucky	43.00 to 46.00	35.00 to 38.00
Missouri	43.00 to 46.00	35.00 to 38.00
Illinois	43.00 to 46.00	35.00 to 38.00
Ground fire clay, per ton	7.00	

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$43.00
Chicago	52.60
Birmingham	50.00
Silica clay, per ton	$8.50 to 10.00

Magnesite Brick

	Per Net Ton
Standard sizes, f.o.b. Baltimore and Chester, Pa.	$65.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00
Standard size	45.00

Chrome Brick

	Per Net Ton
Standard size	$45.00

Mill Prices of Bolts, Nuts, Rivets and Set Screws

Bolts and Nuts

Per 100 Pieces

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
†Machine bolts	70
†Carriage bolts	70
Lag bolts	70
Plow bolts, Nos. 1, 2, 3 and 7 heads	70
Hot-pressed nuts, blank or tapped, square	70
Hot-pressed nuts, blank or tapped, hexagons	70
C.p.c. and t. square or hex. nuts, blank or tapped	70
Washers*	7.00c. to 6.75c. per lb. off list

*F.o.b. Chicago, New York and Pittsburgh.

†Bolts with rolled thread up to and including ⅛ in. x 6 in. take 10 per cent lower list prices.

Bolts and Nuts

	Per Cent Off List
Semi-finished hexagons nuts	70
Semi-finished hexagons castellated nuts, S.A.E.	70
Stove bolts in packages, P'gh	75, 20, 10 and 5
Stove bolts in packages, Chicago	75, 20, 10 and 5
Stove bolts in packages, Cleveland	75, 20, 10 and 5
Stove bolts in bulk, P'gh	75, 20, 10, 5 and 2½
Stove bolts in bulk, Chicago	75, 20, 10, 5 and 2½
Stove bolts in bulk, Cleveland	75, 20, 10, 5 and 2½
Tire bolts	60, 5 and 5

Discounts of 70 per cent off on bolts and nuts applied on carload business. For less than carload orders d'scounts of 55, 60 per cent apply.

Large Rivets

(½-In. and Larger)

	Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland	$3.10
F.o.b. Chicago	3.20

Small Rivets

(⅜-In. and Smaller)

	Per Cent Off List
F.o.b. Pittsburgh	70 and 10
F.o.b. Cleveland	70 and 10
F.o.b. Chicago	70 and 10

Cap and Set Screws

(Freight allowed up to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws	80, 10 and 5
Milled standard set screws, case hardened	80 and 5
Milled headless set screws, cut thread	75 and 10
Upset hex. head cap screws, U.S.S. thread	85
Upset hex. cap screws, S.A.E. thread	85
Upset set screws	80, 10 and 5
Milled studs	70

Chicago

Renewed Demand for Plates Beyond District's Capacity —Look for Revival of Railroad Buying

CHICAGO, July 23.—New demands for plates and semi-finished steel have helped to place sales at the average of the year or about double the volume of the previous seven days. Fully 20 per cent of new purchases were plates for the manufacture of pipe and a liberal tonnage is accounted for by raw steel needs.

Mild steel bars also figured prominently in the week's business, in which rail purchases were of little moment. Deliveries on plates, which had improved in recent weeks to a range of seven to eight weeks, now promise to extend again. Local plate mills find themselves in a position wherein they cannot, if they intend to take care of expected normal business from regular customers, assume added obligations for this commodity and as a result plate orders are once more flowing to the East.

Specifications for plates, shapes and bars average well with recent weeks and match shipments, which are at local mill capacity.

Inquiry from a wide circle of consumers is more active. Interest is growing in the prospect of a revival of equipment purchases by Western railroads. The trade has hopes that the Illinois Central will buy 500 cars for the Central of Georgia and also complete for itself the buying program which was left uncompleted last spring. The Sante Fe and the Union Pacific are mentioned as two other possibilities and then there is the inquiry of long standing by the Chicago & Northwestern.

It is definitely known now that the expansion program of the Illinois Steel Co. will include a structural mill for rolling the Carnegie beam section.

Pig Iron.—Silvery iron is off $1 a ton on the lower grades and as much as $2 a ton on some of the higher grades. The new quotations are not firm and offerings are not attracting wide attention among buyers. The Southern iron market remains mixed as to prices, though $14 a ton, Birmingham, remains an average. Some sales figure back to $13.50 a ton when differentials are included at 25c. instead of the usual 50c. Sales are in moderate volume including 250 tons, which is a duplication of an order placed last week by a melter in western Illinois. A cargo of Lake Erie iron has docked at Milwaukee. Although the bulk of this iron was sold prior to shipment, still odd tonnages are offered that are said to figure as low as $18.50 a ton at Milwaukee. The Northern iron market remains steady at $20 a ton. With five merchant stacks in blast shipments are in excess of production. In fact deliveries so far in July are running only a trifle behind the June rate. Releases by the automobile industry and manufacturers of farm equipment are heavier. The general feeling here is that such lessening as there is in the rate of melting is due more to the vacation period and hot weather than to a definite falling off of business.

Prices per gross ton at Chicago:

N'th'n No. 2 fdy., sil. 1.75 to 2.25	$20.00
N'th'n No. 1 fdy., sil. 2.25 to 2.75	20.50
Malleable, not over 2.25 sil.	20.00
High phosphorus	20.00
Lake Super. charcoal, sil. 1.50	27.04
So'th'n No. 2 fdy. (all rail)	$19.51 to 20.51
Low phos., sil. 1 to 2, copper free	29.50
Silvery, sil. 8 per cent	29.79
Bess. ferrosilicon, 14-15 per cent	46.29

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnace, not including an average switching charge of 61c. per gross ton.

Plates.—New sales of plates account for close to 20 per cent of total finished steel purchases for the week. Moreover, new orders for plates are fully equal to shipments, following several weeks of a quiet market after the completion of the bulk of third quarter contracting. While a part of the plate tonnage placed during the week is for building purposes, the bulk of it will go into the manufacture of steel pipe. Since the first of July there has been steady improvement in deliveries, but new business has checked this trend and promises now are not better than seven to eight weeks. Local mills were not willing to obligate themselves for the full tonnage sought, and again sizable orders for plates for delivery in this district have gone to mills east of Indiana. Interest in oil storage tanks centers in specifications against old orders and in inquiries which are enlarged this week by 3000 tons. Tank fabricating shops are busy and their outlook, as gaged by pending tank programs, is unusually favorable. Reports are persistent that Western railroads are planning new car building programs that will take definite shape early in the fall. The Santa Fe is mentioned as one possible purchaser and the trade expects the Chicago & North Western to revive its inquiry for 1000 to 2500 box cars. Western car shops are well engaged, with schedules now arranged into September. Specifications for car material, though smaller than a week ago, are still of fair size.

Warehouse Prices, f.o.b. Chicago

	Base per Lb.
Plates and structural shapes	3.10c.
Soft steel bars	3.00c.
Reinforc'g bars, billet steel	2.10c. to 2.40c.
Reinforc'g bars, rail steel	1.90c. to 2.05c.
Cold-fin. steel bars and shafting—	
Rounds and hexagons	3.60c.
Flats and squares	4.10c.
Bands (¼ in. in Nos. 10 and 12 gages)	3.20c.
Hoops (No. 14 gage and lighter)	3.75c.
Black sheets (No. 24)	4.05c.
Galv. sheets (No. 24)	4.90c.
Blue ann'l'd sheets (No. 10)	3.35c.
Spikes, ½ in. and larger	3.55c.
Track bolts	4.55c.
Rivets, structural	4.00c.
Rivets, boiler	4.00c.
	Per Cent Off List
Machine bolts	60
Carriage bolts	60
Coach or lag screws	60
Hot-pressed nuts, sq., tap. or blank	60
Hot-pressed nuts, hex., tap. or blank	60
No. 8 black ann'l'd wire, per 100 lb.	$3.45
Com. wire nails, base per keg	3.20
Cement c't'd nails, base per keg	3.20

Ferroalloys. — Shipments are in good volume. New buying is quiet, with prices generally steady. Spiegeleisen is quoted $31 to $34 a ton, furnace, with few takers.

Prices delivered Chicago: 80 per cent ferromanganese, $112.56; 50 per cent ferrosilicon, $83.50 to $88.50; spiegeleisen, 19 to 21 per cent, $40.76.

Structural Material.—This market is more impressive from the viewpoint of the pending list than of current awards. Bids have been opened on the Parker School, Chicago, which will require 2300 tons, and also on the 1800 tons for the Fine Arts Building, but the low tenders have not yet been definitely accepted. Contracts ranging up to 1000 tons each have been more numerous in recent weeks and small and medium-sized shops are no longer hard pressed for immediate work. Large shops, while comfortably booked for the present, would feel more secure if a few of the large pending jobs would move faster. Sales of structural material are in good volume against recent lettings. Specifications, at 6000 tons, are close to the weekly average so far this year. Deliveries show improvement, with promises now ranging from five to six weeks. Awards for the week total close to 3000 tons, of which 1100 tons is for the Burnham Avenue bridge and 850 tons for the West Town Bank Building, both in Chicago.

Mill prices on plain material, per lb.: 2.05c. base, Chicago.

Sheets. — Chicago district sheet mills, operating at about 85 per cent of capacity, are still held in check by supplies of raw steel, inasmuch as orders at hand would warrant a higher rate of output. New buying is steady, but for current needs, and prices, as a week ago, are steady locally on all grades with the exception of light-gage galvanized sheets. Deliveries on blue annealed sheets have been advanced to 12 weeks, while the galvanized and black finishes may be had in three to four weeks. Distribution by jobbers is large and their specifications against contracts are liberal.

Base prices per lb., deliv'd from mill in Chicago: No. 24 black sheets, 3.10c.; No. 24 galv., 3.85c.; No. 10 blue ann'l'd, 2.35c. Deliv'd prices at other Western points are equal to the freight from Gary, plus the mill prices, which are 5c. per 100 lb. lower than Chicago delivered prices.

Cast Iron Pipe.—This market is quiet, with few tonnages before the trade, and new developments do not indicate an early turn for the better. Carload orders are more numerous than a week ago, but the change is not significant as a market factor. The

Lynchburg Foundry Co. has been awarded 9600 ft. of 6-in. and 7800 ft. of 8-in. pipe by Royal Oak, Mich., and the McWane Cast Iron Pipe Co. has taken 9000 ft. of 4-in. and 3000 ft. of 6-in. pipe for Naponee, Neb. Aberdeen, S. D., will take bids on 9800 ft. of 12-in., 9700 ft. of 10-in. and 8700 ft. of 8-in. pipe. This municipality also has a supplementary list for about 8500 ft. of 8 to 12-in. pipe and fittings, on which bids may be taken at a later date.

Prices per net ton, del'd Chicago: Water pipe, 6-in. and over, $45.20 to $46.20; 4-in., $49.20 to $50.20; Class A and gas pipe, $3 extra.

Bars.—Sales of mild steel bars have expanded in recent weeks, as widely diversified users have sought additional tonnages. The average rate at which tonnages are being sent to mills in July is above that of June and well above July, 1928. Specifications are fully equal to shipments, which promise to expand around Aug. 1, when some users will need larger quantities. Prices are steady at 2.05c. a lb., Chicago. Slightly smaller specifications for alloy steel bars are leading producers to cut output two to three points this week. Deliveries are improving, but the change is not marked and promises range from three to four weeks. Spot buying is moderately active at current quotations. Small orders for iron bars at 2.05c. a lb., Chicago, are numerous from railroads and other users. The bulk of the immediate needs of car builders has been supplied, and backlogs are light. Local rail steel bar mills are fully engaged and incoming business is ample to support current output. Barn equipment manufacturers have well arranged schedules for several months to come and the bed industry, in contrast with a year ago at this time, is well engaged. Orders for fence posts are seasonably dull.

Bolts, Nuts and Rivets.—This market is quiet and prices are steady. Current specifications are on a level with the average in recent weeks.

Rails and Track Supplies.—Western mills have booked 3000 tons of standard-section rails. About 2000 tons was for the Pennsylvania, which is reported to have placed 13,000 tons with Eastern mills. The Northern Pacific, which the trade expects will take 15,000 tons, may make its needs known about Aug. 1. Orders for track fastenings total 2500 tons, of which 1500 tons was for iron tie plates for use by railroads in and near Chicago. Rail rolling schedules have been revised downward, the average now being close to 75 per cent of capacity.

Prices f.o.b. mill, per gross ton: Standard section open-hearth and Bess. rails, $43; light rails, rolled from billets, $36. *Per lb.:* Standard railroad spikes, 2.80c.; track bolts with square nuts, 3.80c.; steel tie plates, 2.15c.; angle bars, 2.75c.

Old Material.—Heavy-tonnage buyers of scrap iron and steel, evidently influenced by price fluctuations in previous summers, are holding out of this market except for small lots for immediate needs. Dealers, confident of the underlying strength of the market, are bending every effort to cover short positions. However, in at least one grade, namely, heavy melting steel, indications do not bear out ideas of strength. Shipments against orders from the Gary mills have now been completed and new orders have not been forthcoming from that source. In all probability this will mean that the tonnage formerly diverted to Gary will have to be prepared for other mills, which for some time past have been amply supplied. Hydraulic bundles are moving more freely to mills, though one buyer is still taking this grade in limited tonnages. Prices for short rails are stronger as supplies run short and brokers actively bid against offerings by the railroads. The St. Paul is offering a supplementary list of 1000 tons and the Nickel Plate has advertised 3000 tons.

Prices deliv'd Chicago district consumers:

	Per Gross Ton	
Basic Open-Hearth Grades:		
Heavy melting steel	$14.75 to	$15.25
Shoveling steel	14.75 to	15.25
Frogs, switches and guards, cut apart, and misc. rails	16.50 to	17.00
Hydraul. compressed sheets	13.00 to	13.50
Drop forge flashings	10.50 to	11.00
No. 1 busheling	13.00 to	13.50
Forg'd cast and r'l'd steel carwheels	18.25 to	18.75
Railroad tires, charg. box size	18.50 to	19.00
Railroad leaf springs cut apart	18.50 to	19.00
Acid Open-Hearth Grades:		
Steel couplers and knuckles	16.75 to	17.25
Coil springs	19.00 to	19.50
Electric Furnace Grades:		
Axle turnings	14.50 to	15.00
Low phos. punchings	16.50 to	17.00
Low phos. plates, 12 in. and under	16.50 to	17.00
Blast Furnace Grades:		
Axle turnings	10.75 to	11.25
Cast iron borings	9.75 to	10.25
Short shoveling turnings	9.75 to	10.25
Machine shop turnings	7.00 to	7.50
Rolling Mill Grades:		
Iron rails	16.00 to	16.50
Rerolling rails	17.50 to	18.00
Cupola Grades:		
Steel rails less than 3 ft.	17.75 to	18.25
Steel rails less than 2 ft.	18.25 to	18.75
Angle bars, steel	17.00 to	17.50
Cast iron carwheels	14.00 to	14.50
Malleable Grades:		
Railroad	16.75 to	17.25
Agricultural	15.50 to	16.00
Miscellaneous:		
*Relaying rails, 56 to 60 lb.	23.00 to	25.00
*Relaying rails, 65 lb. and heav.	26.00 to	31.00
	Per Net Ton	
Rolling Mill Grades:		
Iron angle and splice bars	15.00 to	15.50
Iron arch bars and transoms	21.00 to	21.50
Iron car axles	26.00 to	26.50
Steel car axles	16.50 to	17.00
No. 1 railroad wrought	13.50 to	14.00
No. 2 railroad wrought	13.00 to	13.50
No. 1 busheling	9.00 to	9.50
No. 2 busheling	7.00 to	7.50
Locomotive tires, smooth	14.50 to	15.00
Pipes and flues	10.00 to	10.50
Cupola Grades:		
No. 1 machinery cast	14.50 to	15.00
No. 1 railroad cast	13.75 to	14.25
No. 1 agricultural cast	13.25 to	13.75
Stove plates	12.25 to	12.75
Grate bars	11.75 to	12.25
Brake shoes	10.50 to	11.00

*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

Reinforcing Bars.—Awards are at the low point of the year and, though the pending list is of good size, only a few projects appear to be near the closing stage. Fresh inquiry also is light. Demand will improve, however, if large building construction expands as it now promises to do. The Chicago, Milwaukee, St. Paul & Pacific is placing small orders—25 to 50 tons each—against an inquiry for 800 tons for track elevation. There is promise that reinforcing bars will be purchased for Illinois road work, funds for which will soon be available from the new gasoline tax. Recent awards and fresh inquiries are given on page 250.

Wire Products.—Price cutting in common wire nails is spreading and common quotations now are $2.60 to $2.75, base, per keg, Pittsburgh or Cleveland, and $1 a ton above these figures in the Chicago district. Prices for other wire products are, on the whole, little disturbed. The demand for nails, which has been below the expectations of the trade all spring and so far this summer, gives no indications of improvement in the near future. Salesmen returning from vacations have made a good showing, orders for wire having shown some improvement this week. However, neither new orders nor specifications equal production at 65 per cent of capacity and stocks in the hands of producers are slowly increasing. The jobbing trade is quiet. Distributers are cautious in placing orders, which usually are small and which are placed at frequent intervals. Crop reports, on the whole, are favorable. The past two weeks has been favorable to corn, cotton and potatoes. Some of the Northeastern States are in need of rain, as is also true in some of the extreme Northwestern States. Much of the country has had plenty of rain, while in some localities there has been an excess. Mill prices for wire and wire products are given on page 235.

Cold-Rolled Strip.—Specifications are lagging behind output, which so far has held to an 85 per cent rate. Producers look for lower output and shipments at an early date unless the market as a whole makes a turn for the better.

Coke.—July shipments are well up to the average in June and all ovens in this district are lighted. Scattered spot sales are going at $8 a net ton at the ovens.

Republic Gets First Order for Electric-Welded Pipe

YOUNGSTOWN, July 23.—Republic Iron & Steel Co. has received its first sizable order for steel pipe produced by the electrical welding method from the Southwestern Gas Co. The order calls for 200 miles of 6-in. tubing, requiring 8000 tons. The Republic Company has one mill in operation under Johnson patents manufacturing pipe up to 7 in. in diameter, and plans to install two additional mills.

International Steel & Iron Co., Evansville, Ind., recently forwarded the first bargeload of structural steel ever billed from that river port. The cargo aggregated 500 tons and was part of a 1500-ton order for a bridge to be constructed at Terryville, Tenn.

what they should be, considering the heavy backlogs of most of the large producers. The 3.70c. and 2.95c., Pittsburgh, quotations on galvanized and black sheets respectively are now applying on scarcely any business and, although these figures are still quoted, the market has settled to 2.85c. on black sheets and 3.60c. on galvanized. Jobbers are having little difficulty in placing business at the $2 concession usually offered them on galvanized sheets. Automobile companies are said to be able to buy black sheets at 2.75c., base, but, as this business cannot be classified as one-pass material on which the price is usually based, it is not representative of the market. High differentials for pickling and other treatment enable manufacturers to secure an adequate profit on this business which they would not be able to get on the ordinary one-pass product. Large makers in this territory are holding firmly to the 2.20c. and 2.35c., Pittsburgh, quotations on light plates and blue annealed sheets and are making no effort to compete with wide strips, which are sold at lower prices. Weakness has developed on tin mill black plate, which is now quotable at 2.90c. to 3c., Pittsburgh.

Tin Plate. — Demand continues rather steady and specifications for September tonnages from the container manufacturers have been satisfactory. In some cases mills will begin rolling this tonnage some time next week, as present backlogs are not sufficient to maintain the present rate of operations for any length of time. Mills in the district are well over a 90 per cent rate in operations and will continue these schedules for several weeks unless current demand declines suddenly.

Strip Steel.—Some makers of strip steel report heavier tonnage releases thus far in July than were received during the corresponding June period, but demand is rather spotty for both the hot and cold-rolled material. Makers who depend for the bulk of their tonnage on the manufacturers of medium-priced automobiles have been forced to curtail operations somewhat since the first of the month, but a fairly well diversified demand continues from other miscellaneous users of strips. Deliveries are no longer extended for more than two or three weeks except in isolated cases where mill facilities are largely responsible. On hot-rolled strip, prices are well established at 2c., Pittsburgh, for 6-in. and narrower, and 1.90c. for the wider sizes. Concessions of $1 to $2 a ton from the 2.75c., Pittsburgh, price on cold-rolled strip have been reported, but, so far as can be determined, this shading has always occurred under conditions that could not be said to govern the market. Makers generally have refused to meet quotations below 2.75c., although the 2.85c. price, formerly quoted on small-lot business, is gradually disappearing.

Cold-Finished Steel Bars.—Revision of extras on cold-finished steel bars, the details of which will be found elsewhere in this issue, results in slight price reductions when applied to the list as a whole. The new prices will not apply on third quarter tonnage, which is largely covered by contract. July business is holding up to June levels, but operations are largely on a week-to-week basis. Improvement in demand from the automobile industry is expected in a short time, but present specifications do not reflect this tendency. The price of 2.30c., Pittsburgh, is being well maintained.

Bolts, Nuts and Rivets.—Operations have declined slightly from the high rate of the spring months, but the industry as a whole is still running at 60 to 65 per cent of theoretical capacity, an unusually high level for this time of the year. Demand is well diversified, with railroad car builders taking a large tonnage and jobbers steadily requiring shipments. Price conditions are encouraging, with bolts and nuts unchanged at 70 per cent off list and large rivets holding at $3.10 per 100 lb., Pittsburgh or Cleveland.

Coal and Coke.—The furnace coke market shows little change from the previous week, with demand rather quiet and production somewhat higher than the present requirements of the consuming industry. Prices are unchanged at $2.75 to $2.85 a net ton, Connellsville, although producers are asking slightly higher figures on future tonnage in expectation of a stronger demand. On the foundry grade, both shipments and new business are at a low point and the situation is reflected in price uncertainty on all except the premium brands of coke, which are firm at $4.85, ovens. Coal production is holding up fairly well for this time of the year, but no price recovery is expected before fall.

Old Material.—The scrap market has developed further strength in the last week, and No. 1 heavy melting steel is now quotable at $18.50 to $19, the average being an advance of 25c. Although heavy melting steel is offered at some points at $18.75, mills would have difficulty in purchasing any quantity of first quality steel at that figure. One mill in the district which accepts car sides as No. 1 steel paid $18 for a considerable tonnage, and as other consumers will not take car sides at less than $1 a ton under the No. 1 grade, this purchase also bears out the strength of the market. Hydraulic compressed sheets are theoretically stronger but no sales at higher than $18.50, which might justify an advance of 25c. a ton, have been reported. Blast furnace borings and turnings have been sold at $12.75 and $13, and grades of steel which ordinarily reflect the strength of the No. 1 heavy melting grade have gained strength along with it. Rejections are frequent at all points in the district, and the scarcity of high grade No. 1 steel is probably responsible for the general strength of the market. However, with the large consumers nearly all taking scrap in undiminished quantities, and at a rate considerably higher than is usual at this time of the year, a strong market situation is not unexpected. It is freely believed that any marked recession in steel operations would be reflected immediately in the scrap market. And uncertainty on this point has resulted in a cautious attitude on the part of both buyers and sellers of scrap.

Prices per gross ton delivered consumers' yards in Pittsburgh and points taking the Pittsburgh district freight rate:

Basic Open-Hearth Grades:	
No. 1 heavy melting steel	$18.50 to $19.00
No. 2 heavy melting steel	16.50 to 17.00
Scrap rails	18.00 to 18.50
Compressed sheet steel	18.00 to 18.50
Bundled sheets, sides and ends	17.00 to 17.50
Cast iron carwheels	16.50 to 17.00
Sheet bar crops, ordinary	19.50 to 20.00
Heavy breakable cast	13.00 to 13.50
No. 2 railroad wrought	18.50 to 19.00
Hvy. steel axle turnings	16.25 to 16.75
Machine shop turnings	12.00 to 12.50
Acid Open-Hearth Grades:	
Railr. knuckles and couplers	21.50 to 22.00
Railr. coil and leaf springs	21.50 to 22.00
Rolled steel wheels	21.50 to 22.00
Low phos. billet and bloom ends	22.50 to 23.00
Low phos., mill plates	22.50 to 23.00
Low phos., light grades	20.50 to 21.50
Low phos., sheet bar crops	20.50 to 21.50
Heavy steel axle turnings	16.25 to 16.75
Electric Furnace Grades:	
Low phos., punchings	20.00 to 21.00
Hvy. steel axle turnings	16.25 to 16.75
Blast Furnace Grades:	
Short shoveling steel turnings	12.50 to 13.00
Short mixed borings and turnings	12.50 to 13.00
Cast iron borings	12.50 to 13.00
Rolling Mill Grades:	
Steel car axles	21.50 to 22.00
Cupola Grades:	
No. 1 cast	15.00 to 16.00
Rails 3 ft. and under	20.00 to 21.00

Warehouse Prices, f.o.b. Pittsburgh

	Base per Lb.
Plates	3.00c.
Structural shapes	3.00c.
Soft steel bars and small shapes	2.90c.
Reinforcing steel bars	2.75c.
Cold-finished and screw stock—	
Rounds and hexagons	3.60c.
Squares and flats	4.10c.
Bands	3.25c.
Hoops	4.25c.
Black sheets (No. 24), 25 or more bundles	3.80c.
Galv. sheets (No. 24), 25 or more bundles	4.55c.
Blue ann'l'd sheets (No. 10), 1 to 10 sheets	3.45c.
Galv. corrug. sheets (No. 28), per square	$4.43
Spikes, large	3.40c.
Small	3.80c. to 5.25c.
Boat	3.80c.
Track bolts, all sizes, per 100 count,	60 per cent off list
Machine bolts, 100 count,	60 per cent off list
Carriage bolts, 100 count,	60 per cent off list
Nuts, all styles, 100 count,	60 per cent off list
Large rivets, base per 100 lb.	$3.50
Wire, black soft ann'l'd, base per 100 lb.	$3.00 to 3.10
Wire, galv. soft, base per 100 lb.	3.00 to 3.10
Common wire nails, per keg	3.00
Cement coated nails, per keg	3.05

Industrial Plants Corporation, 25 Church Street, New York, has been appointed auctioneer to sell at public auction all of the physical assets of the Wildman Tire & Rubber Co., Port Clinton, Ohio, consisting of land, buildings, machinery, etc.

Semi-Finished Steel, Raw Materials, Bolts and Rivets

Mill Prices of Semi-Finished Steel

Billets and Blooms

	Per Gross Ton
Rerolling, 4 in. and under 10 in., Pittsburgh	$35.00
Rerolling, 4 in. and under 10 in., Youngstown	35.00
Rerolling, 4 in. and under 10 in., Cleveland	35.00
Rerolling, 4 in. and under 10 in., Chicago	37.00
Forging quality, Pittsburgh	$40.00 to 41.00

Sheet Bars

(Open Hearth or Bessemer)

	Per Gross Ton
Pittsburgh	$35.00
Youngstown	35.00
Cleveland	35.00

Slabs

(8 in. x 2 in. and under 10 in. x 10 in.)

	Per Gross Ton
Pittsburgh	$35.00
Youngstown	35.00
Cleveland	35.00

Skelp

(F.o.b. Pittsburgh or Youngstown)

	Per Lb.
Grooved	1.85c. to 1.90c.
Universal	1.85c. to 1.90c.
Sheared	1.85c. to 1.90c.

Wire Rods

(Common soft, base)

	Per Gross Ton
Pittsburgh	$42.00
Cleveland	42.00
Chicago	43.00

Prices of Raw Material

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.50% iron	$4.80
Old range non-Bessemer, 51.50% iron	4.65
Mesabi Bessemer, 51.50% iron	4.65
Mesabi non-Bessemer, 51.50% iron	4.50
High phosphorus, 51.50% iron	4.40

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algerian	10.00c.
Iron ore, low phos., Swedish, average 68% iron	10.00c.
Iron ore, basis Swedish, average 65% iron	9.00c.
Manganese ore, washed, 52% manganese, from the Caucasus	33.00c. to 35.00c.
Manganese ore, Brazilian, African or Indian, basic 50%	33.00c. to 35.00c.
Tungsten ore, high grade, per unit, in 60% concentrates	$15.00 to $15.50

	Per Gross Ton
Chrome ore, 45 to 50% Cr_2O_3, crude, c.i.f. Atlantic seaboard	$22.00 to $24.00

	Per Lb.
Molybdenum ore, 85% concentrates of MoS_2, delivered	50c. to 55c.

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville prompt	$2.75 to $2.85
Foundry, f.o.b. Connellsville prompt	3.75 to 4.85
Foundry, by-product, Ch'go ovens	8.00
Foundry, by-product, New England, del'd	11.00
Foundry, by-product, Newark or Jersey City, del'vered	9.00 to 9.40
Foundry, by-product, Phila.	9.00
Foundry, Birmingham	5.00
Foundry, by-product, St. Louis, f.o.b. ovens	8.00
Foundry by-prod., del'd St. Louis	9.00

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	$1.25 to $1.75
Mine run coking coal, f.o.b. W. Pa. mines	1.50 to 1.75
Gas coal, 3-in. f.o.b. Pa. mines	1.90 to 2.00
Mine run gas coal, f.o.b. Pa. mines	1.65 to 1.75
Steam slack, f.o.b. W. Pa. mines	80c. to 90c.
Gas slack, f.o.b. W. Pa. mines	1.00 to 1.10

Ferromanganese

	Per Gross Ton
Domestic, 80%, seaboard	$105.00
Foreign, 80%, Atlantic or Gulf port, duty paid	105.00

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	$31.00 to $34.00
Domestic, 16 to 19%	29.00 to 32.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50%	$83.50
75%	130.00

	Per Gross Ton Furnace		Per Gross Ton Furnace
10%	$35.00	12%	$39.00
11%	37.00	14 to 16%	45.00

Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio, Furnace

	Per Gross Ton		Per Gross Ton
10%	$30.00	12%	$34.00
11%	32.00		

Silvery Iron

F.o.b. Jackson County, Ohio, Furnace

	Per Gross Ton		Per Gross Ton
6%	$23.00	10%	$27.00 to $28.00
7%	24.00	11%	29.00 to 30.00
8%	25.00	12%	31.00 to 32.00
9%	26.00		

Other Ferroalloys

Ferrotungsten, per lb., contained metal del'd	$1.40 to $1.50
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads	11.00c.
Ferrovanadium, per lb. contained vanadium, f.o.b. furnace	$3.15 to $3.65
Ferrocarbontitanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads	$160.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per gross ton	$91.00
Ferrophosphorus, electric 24%, f.o.b. Anniston, Ala., per gross ton	$122.50

Fluxes and Refractories

Fluorspar

	Per Net Ton
Domestic, 85% and over calcium fluoride, not over 5% silicon, gravel, f.o.b. Illinois and Kentucky mines	$18.00
No. 2 lump, Illinois and Kentucky mines	20.00
Foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Atlantic port, duty paid	$18.00 to $18.50
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silica, f.o.b. Illinois and Kentucky mines	32.50

Fire Clay Brick

	Per 1000 f.o.b. Works	
	High-Heat Duty Brick	Intermediate Heavy Duty Brick
Pennsylvania	$43.00 to $46.00	$35.00 to $38.00
Maryland	43.00 to 46.00	35.00 to 38.00
New Jersey	50.00 to 65.00	.....
Ohio	43.00 to 46.00	35.00 to 38.00
Kentucky	43.00 to 46.00	35.00 to 38.00
Missouri	43.00 to 46.00	35.00 to 38.00
Illinois	43.00 to 46.00	35.00 to 38.00
Ground fire clay, per ton	7.00	

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$43.00
Chicago	52.00
Birmingham	50.00
Silica clay, per ton	$8.50 to 10.00

Magnesite Brick

	Per Net Ton
Standard sizes, f.o.b. Baltimore and Chester, Pa.	$65.00
Gra'n magnesite, f.o.b. Baltimore and Chester, Pa.	40.00
Standard size	45.00

Chrome Brick

	Per Net Ton
Standard size	$45.00

Mill Prices of Bolts, Nuts, Rivets and Set Screws

Bolts and Nuts

Per 100 Pieces

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
†Machine bolts	70
†Carriage bolts	70
Lag bolts	70
Plow bolts, Nos. 1, 2, 3 and 7 heads	70
Hot-pressed nuts, blank or tapped, square	70
Hot-pressed nuts, blank or tapped, hexagons	70
C.p.c. and t. square or hex. nuts, blank or tapped	70
Washers*	7.00c. to 6.75c. per lb. off list

*F.o.b. Chicago, New York and Pittsburgh.

†Bolts with rolled thread up to and including ¼ in. x 6 in. take 10 per cent lower list prices.

Bolts and Nuts

	Per Cent Off List
Semi-finished hexagons nuts	70
Semi-finished hexagons castellated nuts, S.A.E.	70
Stove bolts in packages, P'gh	75, 20, 10 and 5
Stove bolts in packages, Chicago	75, 20, 10 and 5
Stove bolts in packages, Cleveland	75, 20, 10 and 5
Stove bolts in bulk, P'gh	75, 20, 10, 5 and 2½
Stove bolts in bulk, Chicago	75, 20, 10, 5 and 2½
Stove bolts in bulk, Cleveland	75, 20, 10, 5 and 2½
Tire bolts	60, 5 and 5

Discounts of 70 per cent off on bolts and nuts applied on carload business. For less than carload orders discounts of 55, 60 per cent apply.

Large Rivets

(½-In. and Larger)

	Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland	$3.10
F.o.b. Chicago	3.20

Small Rivets

(½-In. and Smaller)

	Per Cent Off List
F.o.b. Pittsburgh	70 and 10
F.o.b. Cleveland	70 and 10
F.o.b. Chicago	70 and 10

Cap and Set Screws

(Freight allowed up to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws	80, 10 and 5
Milled standard set screws, case hardened	80 and 5
Milled headless set screws, cut thread	75 and 10
Upset hex. head cap screws, U.S.S. thread	85
Upset hex. cap screws, S.A.E. thread	85
Upset set screws	80, 10 and 5
Milled studs	70

Chicago

Renewed Demand for Plates Beyond District's Capacity —Look for Revival of Railroad Buying

CHICAGO, July 23.—New demands for plates and semi-finished steel have helped to place sales at the average of the year or about double the volume of the previous seven days. Fully 20 per cent of new purchases were plates for the manufacture of pipe and a liberal tonnage is accounted for by raw steel needs.

Mild steel bars also figured prominently in the week's business, in which rail purchases were of little moment. Deliveries on plates, which had improved in recent weeks to a range of seven to eight weeks, now promise to extend again. Local plate mills find themselves in a position wherein they cannot, if they intend to take care of expected normal business from regular customers, assume added obligations for this commodity and as a result plate orders are once more flowing to the East.

Specifications for plates, shapes and bars average well with recent weeks and match shipments, which are at local mill capacity.

Inquiry from a wide circle of consumers is more active. Interest is growing in the prospect of a revival of equipment purchases by Western railroads. The trade has hopes that the Illinois Central will buy 500 cars for the Central of Georgia and also complete for itself the buying program which was left uncompleted last spring. The Sante Fe and the Union Pacific are mentioned as two other possibilities and then there is the inquiry of long standing by the Chicago & Northwestern.

It is definitely known now that the expansion program of the Illinois Steel Co. will include a structural mill for rolling the Carnegie beam section.

Pig Iron.—Silvery iron is off $1 a ton on the lower grades and as much as $2 a ton on some of the higher grades. The new quotations are not firm and offerings are not attracting wide attention among buyers. The Southern iron market remains mixed as to prices, though $14 a ton, Birmingham, remains an average. Some sales figure back to $13.50 a ton when differentials are included at 25c. instead of the usual 50c. Sales are in moderate volume including 250 tons, which is a duplication of an order placed last week by a melter in western Illinois. A cargo of Lake Erie iron has docked at Milwaukee. Although the bulk of this iron was sold prior to shipment, still odd tonnages are offered that are said to figure as low as $18.50 a ton at Milwaukee. The Northern iron market remains steady at $20 a ton. With five merchant stacks in blast shipments are in excess of production. In fact deliveries so far in July are running only a trifle behind the June rate. Releases by the automobile industry and manufacturers of farm equipment are heavier. The general feeling here is that such lessening as there is in the rate of melting is due more to the vacation period and hot weather than to a definite falling off of business.

Prices per gross ton at Chicago:

N'th'n No. 2 fdy., sil. 1.75 to 2.25	$20.00
N'th'n No. 1 fdy., sil. 2.25 to 2.75	20.50
Malleable, not over 2.25 sil.	20.00
High phosphorus	20.00
Lake Super. charcoal, sil. 1.50	27.04
So'th'n No. 2 fdy. (all rail)	$19.51 to 20.51
Low phos., sil. 1 to 2, copper free	29.50
Silvery, sil. 8 per cent	29.79
Less, ferrosilicon, 14-15 per cent	46.29

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnace, not including an average switching charge of 61c. per gross ton.

Plates.—New sales of plates account for close to 20 per cent of total finished steel purchases for the week. Moreover, new orders for plates are fully equal to shipments, following several weeks of a quiet market after the completion of the bulk of third quarter contracting. While a part of the plate tonnage placed during the week is for building purposes, the bulk of it will go into the manufacture of steel pipe. Since the first of July there has been steady improvement in deliveries, but new business has checked this trend and promises now are not better than seven to eight weeks. Local mills were not willing to obligate themselves for the full tonnage sought, and again sizable orders for plates for delivery in this district have gone to mills east of Indiana. Interest in oil storage tanks centers in specifications against old orders and in inquiries which are enlarged this week by 3000 tons. Tank fabricating shops are busy and their outlook, as gaged by pending tank programs, is unusually favorable. Reports are persistent that Western railroads are planning new car building programs that will take definite shape early in the fall. The Santa Fe is mentioned as one possible purchaser and the trade expects the Chicago & North Western to revive its inquiry for 1000 to 2500 box cars. Western car shops are well engaged, with schedules now arranged into September. Specifications for car material, though smaller than a week ago, are still of fair size.

Warehouse Prices, f.o.b. Chicago

	Base per Lb.
Plates and structural shapes	3.10c.
Soft steel bars	3.00c.
Reinforc'g bars, billet steel	2.10c. to 2.40c.
Reinforc'g bars, rail steel	1.90c. to 2.05c.
Cold-fin. steel bars and shafting—	
Rounds and hexagons	3.60c.
Flats and squares	4.10c.
Bands, ¾ in. in Nos. 10 and 12 gages	3.20c.
Hoops (No. 14 gage and lighter)	3.75c.
Black sheets (No. 24)	4.05c.
Galv. sheets (No. 24)	4.90c.
Blue ann'l'd sheets (No. 10)	3.35c.
Spikes, ½ in. and larger	3.55c.
Track bolts	4.55c.
Rivets, structural	4.00c.
Rivets, boiler	4.00c.

	Per Cent Off List
Machine bolts	60
Carriage bolts	60
Coach or lag screws	60
Hot-pressed nuts, sq., tap. or blank	60
Hot-pressed nuts, hex., tap. or blank	60
No. 8 black ann'l'd wire, per 100 lb.	$3.45
Com. wire nails, base per keg	3.20
Cement c't'd nails, base per keg	3.20

Ferroalloys. — Shipments are in good volume. New buying is quiet, with prices generally steady. Spiegeleisen is quoted $31 to $34 a ton, furnace, with few takers.

Prices delivered Chicago: 80 per cent ferromanganese, $112.56; 50 per cent ferrosilicon, $83.50 to $88.50; spiegeleisen, 19 to 21 per cent, $40.76.

Structural Material.—This market is more impressive from the viewpoint of the pending list than of current awards. Bids have been opened on the Parker School, Chicago, which will require 2300 tons, and also on the 1800 tons for the Fine Arts Building, but the low tenders have not yet been definitely accepted. Contracts ranging up to 1000 tons each have been more numerous in recent weeks and small and medium-sized shops are no longer hard pressed for immediate work. Large shops, while comfortably booked for the present, would feel more secure if a few of the large pending jobs would move faster. Sales of structural material are in good volume against recent lettings. Specifications, at 6000 tons, are close to the weekly average so far this year. Deliveries show improvement, with promises now ranging from five to six weeks. Awards for the week total close to 3000 tons, of which 1100 tons is for the Burnham Avenue bridge and 850 tons for the West Town Bank Building, both in Chicago.

Mill prices on plain material, per lb.: 2.05c. base, Chicago.

Sheets. — Chicago district sheet mills, operating at about 85 per cent of capacity, are still held in check by supplies of raw steel, inasmuch as orders at hand would warrant a higher rate of output. New buying is steady, but for current needs, and prices, as a week ago, are steady locally on all grades with the exception of light-gage galvanized sheets. Deliveries on blue annealed sheets have been advanced to 12 weeks, while the galvanized and black finishes may be had in three to four weeks. Distribution by jobbers is large and their specifications against contracts are liberal.

Base prices per lb., deliv'd from mill in Chicago: No. 24 black sheets, 3.10c.; No. 24 galv., 3.85c.; No. 10 blue ann'l'd, 2.35c. Deliv'd prices at other Western points are equal to the freight from Gary, plus the mill prices, which are 5c. per 100 lb. lower than Chicago delivered prices.

Cast Iron Pipe.—This market is quiet, with few tonnages before the trade, and new developments do not indicate an early turn for the better. Carload orders are more numerous than a week ago, but the change is not significant as a market factor. The

Lynchburg Foundry Co. has been awarded 9600 ft. of 6-in. and 7800 ft. of 8-in. pipe by Royal Oak, Mich., and the McWane Cast Iron Pipe Co. has taken 9000 ft. of 4-in. and 3000 ft. of 6-in. pipe for Naponee, Neb. Aberdeen, S. D., will take bids on 9800 ft. of 12-in., 9700 ft. of 10-in. and 8700 ft. of 8-in. pipe. This municipality also has a supplementary list for about 8500 ft. of 8 to 12-in. pipe and fittings, on which bids may be taken at a later date.

Prices per net ton, del'd Chicago: Water pipe, 6-in. and over, $45.20 to $46.20; 4-in., $49.20 to $50.20; Class A and gas pipe, $3 extra.

Bars.—Sales of mild steel bars have expanded in recent weeks, as widely diversified users have sought additional tonnages. The average rate at which tonnages are being sent to mills in July is above that of June and well above July, 1928. Specifications are fully equal to shipments, which promise to expand around Aug. 1, when some users will need larger quantities. Prices are steady at 2.05c. a lb., Chicago. Slightly smaller specifications for alloy steel bars are leading producers to cut output two to three points this week. Deliveries are improving, but the change is not marked and promises range from three to four weeks. Spot buying is moderately active at current quotations. Small orders for iron bars at 2.05c. a lb., Chicago, are numerous from railroads and other users. The bulk of the immediate needs of car builders has been supplied, and backlogs are light. Local rail steel bar mills are fully engaged and incoming business is ample to support current output. Barn equipment manufacturers have well arranged schedules for several months to come and the bed industry, in contrast with a year ago at this time, is well engaged. Orders for fence posts are seasonably dull.

Bolts, Nuts and Rivets.—This market is quiet and prices are steady. Current specifications are on a level with the average in recent weeks.

Rails and Track Supplies.—Western mills have booked 3000 tons of standard-section rails. About 2000 tons was for the Pennsylvania, which is reported to have placed 13,000 tons with Eastern mills. The Northern Pacific, which the trade expects will take 15,000 tons, may make its needs known about Aug. 1. Orders for track fastenings total 2500 tons, of which 1500 tons was for iron tie plates for use by railroads in and near Chicago. Rail rolling schedules have been revised downward, the average now being close to 75 per cent of capacity.

Prices f.o.b. mill, per gross ton: Standard section open-hearth and Bess. rails, $43; light rails, rolled from billets, $36. *Per lb.:* Standard railroad spikes, 2.80c.; track bolts with square nuts, 3.80c.; steel tie plates, 2.15c.; angle bars, 2.75c.

Old Material.—Heavy-tonnage buyers of scrap iron and steel, evidently influenced by price fluctuations in previous summers, are holding out of this market except for small lots for immediate needs. Dealers, confident of the underlying strength of the market, are bending every effort to cover short positions. However, in at least one grade, namely, heavy melting steel, indications do not bear out ideas of strength. Shipments against orders from the Gary mills have now been completed and new orders have not been forthcoming from that source. In all probability this will mean that the tonnage formerly diverted to Gary will have to be prepared for other mills, which for some time past have been amply supplied. Hydraulic bundles are moving more freely to mills, though one buyer is still taking this grade in limited tonnages. Prices for short rails are stronger as supplies run short and brokers actively bid against offerings by the railroads. The St. Paul is offering a supplementary list of 1000 tons and the Nickel Plate has advertised 3000 tons.

Prices delv'd Chicago district consumers:

Per Gross Ton	
Basic Open-Hearth Grades:	
Heavy melting steel	$14.75 to $15.25
Shoveling steel	14.75 to 15.25
Frogs, switches and guards, cut apart, and misc. rails	16.50 to 17.00
Hydraul. compressed sheets	13.00 to 13.50
Drop forge flashings	10.50 to 11.00
No. 1 busheling	13.00 to 13.50
Forg'd cast and r'l'd steel carwheels	18.25 to 18.75
Railroad tires, charg. box size	18.50 to 19.00
Railroad leaf springs cut apart	18.50 to 19.00
Acid Open-Hearth Grades:	
Steel couplers and knuckles	16.75 to 17.25
Coil springs	19.00 to 19.50
Electric Furnace Grades:	
Axle turnings	14.50 to 15.00
Low phos. punchings	16.50 to 17.00
Low phos. plates, 12 in. and under	16.50 to 17.00
Blast Furnace Grades:	
Axle turnings	10.75 to 11.25
Cast iron borings	9.75 to 10.25
Short shoveling turnings	9.75 to 10.25
Machine shop turnings	7.00 to 7.50
Rolling Mill Grades:	
Iron rails	16.00 to 16.50
Rerolling rails	17.50 to 18.00
Cupola Grades:	
Steel rails less than 3 ft.	17.75 to 18.25
Steel rails less than 2 ft.	18.25 to 18.75
Angle bars, steel	17.00 to 17.50
Cast iron carwheels	14.00 to 14.50
Malleable Grades:	
Railroad	16.75 to 17.25
Agricultural	15.50 to 16.00
Miscellaneous:	
*Relaying rails, 56 to 60 lb.	23.00 to 25.00
*Relaying rails, 65 lb. and heav.	26.00 to 31.00
Per Net Ton	
Rolling Mill Grades:	
Iron angle and splice bars	15.00 to 15.50
Iron arch bars and transoms	21.00 to 21.50
Iron car axles	26.00 to 26.50
Steel car axles	16.50 to 17.00
No. 1 railroad wrought	13.50 to 14.00
No. 2 railroad wrought	13.00 to 13.50
No. 1 busheling	9.00 to 9.50
No. 2 busheling	7.00 to 7.50
Locomotive tires, smooth	14.50 to 15.00
Pipes and flues	10.00 to 10.50
Cupola Grades:	
No. 1 machinery cast	14.50 to 15.00
No. 1 railroad cast	13.75 to 14.25
No. 1 agricultural cast	13.25 to 13.75
Stove plates	12.25 to 12.75
Grate bars	11.75 to 12.25
Brake shoes	10.50 to 11.00

*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

Reinforcing Bars.—Awards are at the low point of the year and, though the pending list is of good size, only a few projects appear to be near the closing stage. Fresh inquiry also is light. Demand will improve, however, if large building construction expands as it now promises to do. The Chicago, Milwaukee, St. Paul & Pacific is placing small orders—25 to 50 tons each—against an inquiry for 800 tons for track elevation. There is promise that reinforcing bars will be purchased for Illinois road work, funds for which will soon be available from the new gasoline tax. Recent awards and fresh inquiries are given on page 250.

Wire Products.—Price cutting in common wire nails is spreading and common quotations now are $2.60 to $2.75, base, per keg, Pittsburgh or Cleveland, and $1 a ton above these figures in the Chicago district. Prices for other wire products are, on the whole, little disturbed. The demand for nails, which has been below the expectations of the trade all spring and so far this summer, gives no indications of improvement in the near future. Salesmen returning from vacations have made a good showing, orders for wire having shown some improvement this week. However, neither new orders nor specifications equal production at 65 per cent of capacity and stocks in the hands of producers are slowly increasing. The jobbing trade is quiet. Distributers are cautious in placing orders, which usually are small and which are placed at frequent intervals. Crop reports, on the whole, are favorable. The past two weeks has been favorable to corn, cotton and potatoes. Some of the Northeastern States are in need of rain, as is also true in some of the extreme Northwestern States. Much of the country has had plenty of rain, while in some localities there has been an excess. Mill prices for wire and wire products are given on page 235.

Cold-Rolled Strip.—Specifications are lagging behind output, which so far has held to an 85 per cent rate. Producers look for lower output and shipments at an early date unless the market as a whole makes a turn for the better.

Coke.—July shipments are well up to the average in June and all ovens in this district are lighted. Scattered spot sales are going at $8 a net ton at the ovens.

Republic Gets First Order for Electric-Welded Pipe

YOUNGSTOWN, July 23.—Republic Iron & Steel Co. has received its first sizable order for steel pipe produced by the electrical welding method from the Southwestern Gas Co. The order calls for 200 miles of 6-in. tubing, requiring 8000 tons. The Republic Company has one mill in operation under Johnson patents manufacturing pipe up to 7 in. in diameter, and plans to install two additional mills.

International Steel & Iron Co., Evansville, Ind., recently forwarded the first bargeload of structural steel ever billed from that river port. The cargo aggregated 500 tons and was part of a 1500-ton order for a bridge to be constructed at Terryville, Tenn.

New York

Heavier Inquiry for Pig Iron—July Steel Bookings Ahead of Volume Last Year

NEW YORK, July 23.—Pig iron sales are heavier, having totaled 12,000 tons in the past week, and demand is expanding. Including 10,000 tons wanted for various plants of the American Radiator Co., pending inquiry aggregates 20,000 tons. Melt is generally holding its own and in some cases is improving. The operations of foundries making heating equipment are pointing upward as they approach fall and the heavier seasonal demands that will be felt at that time. The Chapman Valve Mfg. Co., Indian Orchard, Mass., has closed for 2000 tons, and the Worthington Pump & Machinery Corporation has bought 200 tons for its Holyoke, Mass., plant. The A. P. Smith Mfg. Co., East Orange, N. J., has placed 600 tons of No. 2 plain and No. 2X for the fourth quarter requirements of its Bloomfield foundry. The Eastern Malleable Iron Co., Naugatuck, Conn., is in the market for 1000 to 2000 tons. The competition of Alabama iron is still more of a threat than an actuality. The only large recent sale reported in this section was 50,000 tons now being shipped by the Tennessee Coal, Iron & Railroad Co. to the Burlington, N. J., pipe plant. This iron is moving by rail to Norfolk, Va., and from there by barge to destination. The proposed reduced rail and water rates from Birmingham via Savannah, Ga., and coastwise ocean vessels to North Atlantic ports have been protested, but not suspended as reported last week. The Interstate Commerce Commission has until Aug. 1 to act on the protests of Northern furnaces. Going prices on Northern pig iron show little change. On No. 2 plain, quotations lower than $17.50, Buffalo, or equivalent, are rarely reported, but silicon differentials on higher grades are frequently waived. The barge movement from Buffalo has increased, although still below the volume of a year ago. A seasonal decline in water shipments of other commodities has caused a downward revision of rates on pig iron, $2 a ton now being readily available on the haul from Buffalo to New York harbor.

Prices per gross ton, delivered New York district:

Buffalo No. 2 fdy., sil. 1.75 to 2.25	$22.41 to $22.91
*Buf. No. 2, del'd east. N. J.	20.78 to 21.28
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	21.39 to 22.52
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	21.89 to 23.02

Freight rates: $4.91 from Buffalo, $1.39 to $2.52 from eastern Pennsylvania.

*Price delivered to New Jersey cities having rate of $3.28 a ton from Buffalo.

Warehouse Business.—Buying since July 1 has been smaller than in June, demand for structural shapes and black and galvanized sheets having declined considerably. Prices are unchanged, but concessions on sheets of $1 to $2 a ton continue. On a recent sizable purchase of blue annealed sheets, subject to the quantity reduction of 40c. per 100 lb. from 3.90c., base, for more than 15,000 lb., the price is reported to have been 3.30c. per lb.

Cast Iron Pipe.—Inquiry from private users has been increasing recently, and there is a small tonnage of municipal business. Most producers of pressure pipe, however, are apparently in need of orders and with competition keen, prices continue from about $31 to $34 per net ton, f.o.b. Northern foundry. The Eastman Kodak Co., Rochester, N. Y., is inquiring for 6240 net tons of 30-in. pipe for delivery to Rochester about Aug. 15. The Water Supply district of Bolton Township, Bolton Landing, N. Y., opened bids July 23 on 193 tons of 6-in., 159 tons of 8-in. and 250 tons of 10-in. water pipe, a total of 612 tons. The Fox Reynolds Co., Inc., general contractor, 81 East 125th Street, New York, is asking for bids on about 14,300 ft. of 3 to 30-in. pipe for Orangeburg, N. Y., and about 4000 ft. of 4 to 30-in. pipe for Wassaic, N. Y.

Prices per net ton deliv'd New York: Water pipe, 6-in. and larger, $32.60 to $34.60; 4-in. and 5-in., $35.60 to $37.60; 3-in., $42.60 to $44.60. Class A and gas pipe, $3 extra.

Reinforcing Bars.—There has been a fair number of small jobs closed, but inquiries are light. The Chevrolet Motor Co. is taking bids on 700 tons of bars for a plant at Tarrytown, N. Y. Prices are reported firm and unchanged.

Billet steel reinforcing bars in 40, 50 and 60-ft. lengths, 2.05c. per lb., Pittsburgh, and 2.30c. per lb., Pittsburgh warehouse, for cut lengths. Out of New York warehouse, 2.90c. per lb. for lots of 5 tons or more, 3.05c. for lots of 2 to 5 tons and 3.30c. for less than 2 tons, all delivered at job.

Finished Steel.—Despite a tapering off in specifications and orders, producers of steel bars and plates declare that July bookings will show a large gain over those in the corresponding month of last year. The tonnage of plates going into the oil industry is causing favorable comment. Two large pipe line contracts, reported last week as pending, have not yet been closed. The revival of interest in shipbuilding also is expected to bring with it a demand for substantial plate tonnages. Structural steel has continued active, both from the standpoint of bookings and of fresh inquiries. The latter included 13,200 tons for section 5, route 108, of the New York subway in Queens, 3800 tons for an office building in Newark, N. J., and 3000 tons for a factory at East Hartford, Conn., for the Pratt & Whitney Aircraft Corporation. Despite a well sustained demand from consumers, the sheet market has developed further weakness. Galvanized sheets have been sold as low as 3.50c., Pittsburgh, a concession of $2 a ton from the previous week's price and a drop of $4 a ton from the level which prevailed two weeks ago. Although considerable business is still being booked at 3.60c., consumers look

Warehouse Prices, f.o.b New York

	Base per Lb.
Plates and structural shapes	3.30c.
Soft steel bars, small shapes	3.25c.
Iron bars	3.24c.
Iron bars, Swed. charcoal	7.00c. to 7.25c.
Cold-fin. shafting and screw stock—	
Rounds and hexagons	3.60c.
Flats and squares	4.10c.
Cold-roll. strip, soft and quarter hard	5.15c. to 5.40c.
Hoops	4.25c.
Bands	3.75c.
Blue ann'l'd sheets (No. 10)	3.85c. to 3.90c.
Long terne sheets (No. 24)	5.80c.
Standard tool steel	12.00c.
Wire, black annealed	4.50c.
Wire, galv. annealed	5.15c.
Tire steel, 1½ x ½ in. and larger	3.30c.
Smooth finish, 1 to 2½ x ¼ in. and larger	3.65c.
Open-hearth spring steel, bases	4.50c. to 7.00c.

	Per Cent Off List
Machine bolts, cut thread:	
¾ x 6 in. and smaller	60
1 x 30 in. and smaller	50 to 50 and 10
Carriage bolts, cut thread:	
½ x 6 in. and smaller	60
¾ x 20 in. and smaller	50 to 50 and 10
Coach screws:	
½ x 6 in. and smaller	60
1 x 6 in. and smaller	50 to 50 and 10

Boiler Tubes—	Per 100 Ft.
Lap welded, 2-in.	$17.33
Seamless steel, 2-in.	20.24
Charcoal iron, 2-in.	25.00
Charcoal iron, 4-in.	67.00

Discounts on Welded Pipe

Standard Steel—	Black	Galv.
½-in. butt	46	29
¾-in. butt	51	37
1-2-in. butt	53	39
2½-6-in. lap	48	35
7 and 8-in. lap	44	17
11 and 12-in. lap	37	12
Wrought Iron—		
½-in. butt	5	+19
¾-in. butt	11	+ 9
1-1½-in. butt	14	+ 6
2-in. lap	5	+14
3-6-in. lap	11	+ 6
7-12-in. lap	3	+16

Tin Plate (14 x 20 in.)

	Prime	Seconds
Coke, 100 lb. base box	$6.45	$6.20
Charcoal, per Box—	A	AAA
IC	$9.70	$12.10
IX	12.00	14.25
IXX	13.90	16.00

Terne Plate (14 x 20 in.)

IC—20-lb. coating	$10.00 to $11.00
IC—30-lb. coating	12.00 to 13.00
IC—40-lb. coating	13.75 to 14.25

Sheets, Box Annealed—Black, C. R. One Pass

	Per Lb.
Nos. 18 to 20	3.80c.
No. 22	3.95c.
No. 24	4.00c.
No. 26	4.10c.
No. 28*	4.25c.
No. 30	4.50c.

Sheets, Galvanized

	Per Lb.
No. 14	4.40c.
No. 16	4.25c.
No. 18	4.40c.
No. 20	4.50c.
No. 22	4.60c.
No. 24	4.75c.
No. 26	5.00c.
No. 28*	5.25c.
No. 30	5.65c.

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

for 3.50c. as an early ruling quotation. Shading has been done in black and blue annealed sheets, but the tendency to grant lower prices has not been common.

Mill prices per lb., deliv'd New York: Soft steel bars, 2.29c.; plates, 2.22½c.; structural shapes, 2.19½c.; bar iron, 2.14c.

Coke.—Although production in the Connellsville district shows no recession despite the season, prices are well maintained. Standard furnace coke is still quoted at $2.75 to $2.85 per net ton, ovens. Special brands of beehive foundry coke are $4.85 per net ton, ovens, or $8.56 per net ton, delivered to northern New Jersey, Jersey City, and Newark, and $9.44 to New York or Brooklyn. By-product coke is quoted at $9 to $9.40 a net ton, Newark or Jersey City, and $10.06, New York or Brooklyn.

Old Material.—About 10,000 tons of No. 1 heavy melting steel has been brought by a cosumer at Coatesville, Pa., at $17 per ton, delivered. Brokers have been quoting $16.50 per ton, delivered Coatesville, on old contracts and have paid up to $16.75 per ton to obtain sufficient material. Machine shop turnings are slightly stronger, with dealers paying $11.25 per ton, delivered to Phoenixville, Pa., and up to $11.50 per ton, delivered to Conshohocken, Pa. Forge fire also shows a slight advance, with $13.75 per ton quoted on deliveries to a Coatesville, Pa., consumer. Cast scrap is rather inactive and brokers are offering about $14.50 per ton, delivered, for heavy breakable cast and $11.50 to $12, delivered, for stove plate.

Dealers' buying prices per gross ton, f.o.b. New York:

No. 1 heavy melting steel	$12.75 to $13.35
Heavy melting steel (yard)	8.00 to 9.75
No. 1 hvy. breakable cast	10.75 to 11.75
Stove plate (steel works)	8.00 to 8.25
Locomotive grate bars	8.25 to 8.75
Machine shop turnings	7.25 to 7.75
Short shoveling turnings	7.25 to 7.75
Cast borings (blast furn. or steel works)	7.00 to 7.25
Mixed borings and turnings	6.75 to 7.25
Steel car axles	19.25 to 19.75
Iron car axles	24.00 to 25.00
Iron and steel pipe (1 in. dia., not under 2 ft. long)	10.75
Forge fire	9.75 to 10.25
No. 1 railroad wrought	12.00 to 12.50
No. 1 yard wrought, long	11.00 to 11.50
Rails for rolling	13.00 to 13.50
Cast iron carwheels	12.25 to 12.50
Stove plate (foundry)	8.00 to 8.50
Malleable cast (railroad)	14.00 to 14.50
Cast borings (chemical)	10.00 to 10.50

Prices per gross ton, deliv'd local foundries:

No. 1 machry. cast	$17.00
No. 1 hvy. cast (columns, bldg. materials, etc.), cupola size	15.00
No. 2 cast (radiators, cast boilers, etc.)	14.50

Warehouse Prices, f.o.b. Cleveland

	Base per Lb.
Plates and struc. shapes	3.00c.
Soft steel bars	3.00c.
Reinforc. steel bars	2.25c. to 2.50c.
Cold-fin. rounds and hex.	3.65c.
Cold-fin. flats and sq.	4.15c.
Hoops and bands, No. 12 to ⅞ in., inclusive	3.25c.
Hoops and bands, No. 13 and lighter	3.65c.
Cold-finished strip	*5.95c.
Black sheets (No. 24)	3.70c. to 3.90c.
Galvanized sheets (No. 24)	4.60c. to 4.75c.
Blue ann'l'd sheets (No. 10)	3.25c.
No. 9 ann'l'd wire, per 100 lb.	$2.95
No. 9 gal. wire, per 100 lb.	3.40
Com. wire nails, base per keg	2.95

*Net base, including boxing and cutting to length.

Cleveland

High Operations Assured Through August—Automobile Demand One-Third Off From Spring Peak

CLEVELAND, July 23.—The changing over by some of the automobile companies to the manufacture of new models has brought about a further slowing up in shipping orders for the grades of steel the automobile companies use. Sheets and strip steel have been affected to the largest extent. In sheet steel, takings by the automobile industry have declined probably 25 to 35 per cent from the peak rate of the spring, according to some estimates.

New models are being brought out by Buick, Chrysler, Reo and Hudson, and it is expected in the steel trade that orders from these companies will again show an upward trend in August.

Many of the sheet mills still have large backlogs in some finishes, but the need for new business, particularly in the common finishes, is bringing out some price concessions on heavy gage blue annealed material, while on black sheets 2.85c., Pittsburgh, now appears to be the maximum obtainable except in a few special instances where the black sheet base is used for sheets of higher finishes. In products other than those used by the automobile industry, the July demand is holding at a high rate.

In plates, shapes and bars, orders and specifications are keeping pace with the June volume. A leading producer has, in fact, booked more tonnage in these products this month than in the corresponding period in June.

Mill operations are being held at virtually a maximum rate. Orders now on the books, with those which can be counted upon, assure steady output through August, although it may be at a slightly reduced pace. Shipments are greater than incoming business, with resultant reduction in backlogs.

Iron Ore.—Consumption of Lake Superior iron ore declined 303,596 tons in June, as compared with May, according to figures compiled by the Lake Superior Iron Ore Association. The June total was 5,676,652 and that for May was 5,980,248 gross tons. The June consumption was more than 1,000,000 tons greater than that of the same month last year, the figure for June, 1928, having been 4,667,493. Ore on hand as of July 1 at furnaces and on docks was 23,701,011 tons, of which 19,618,611 tons was at furnaces and 4,082,400 tons was on Lake Erie docks. The number of furnaces using Lake ore which were in blast on the last day of June was 197, one more than on the last day of May.

Pig Iron.—Sales of pig iron in the past week, at about 20,000 tons, were almost double those of the preceding week. Shipments as well as sales have gained, although not so much iron is going to consumers as was shipped last month. However, the leading producers are moving as much as they are making. Inquiry is not very heavy, nor is it expected to be within the next 30 days or so, as melters generally are well covered for the quarter and furnaces have substantial backlogs. There was a good-sized carryover tonnage from the second quarter. Not much interest is being shown by melters in the fourth quarter. However, an inquiry for 5000 tons from an Indiana company, which probably will be closed this week, is for shipment over the remainder of the third quarter and all of the fourth quarter. Prices are holding firm at $18.50, Cleveland, for outside shipment, at $19 for local delivery, and $20, Lake furnace, for Michigan territory. While the break in prices of Alabama pig iron may have made buyers cautious, it has had no other effect on the pig iron situation in the Cleveland district. Northern consumers have become educated to the use of pig iron that runs lower in phosphorus and higher in manganese than does the Southern iron, and offers of Southern iron hereabouts have not resulted in much business. Demand for low phosphorus iron is very quiet, but prices are unchanged at $26.50 to $27, furnace.

Prices per gross ton at Cleveland:

N'th'n fdy., sil. 1.75 to 2.25	$19.50
S'th'n fdy., 1.75 to 2.25	$20.00 to 20.50
Malleable	19.50
Ohio silvery, 8 per cent	28.00
Basic Valley furnace	18.50
Stand. low phos., Valley	26.50 to 27.00

Prices except on basic and low phosphorus are delivered Cleveland. Freight rates: 50c. from local furnaces; $3 from Jackson, Ohio; $6 from Birmingham.

Semi-Finished Steel.—The leading local producer of semi-finished steel has its entire third-quarter output under contract and has actual specifications on hand for three weeks' rollings. The price situation seems to have become stabilized at $35, Cleveland, Youngstown or Pittsburgh, for billets, slabs and sheet bars.

Reinforcing Steel.—Demand locally has struck a midsummer lull. A clothing factory for Richman Brothers in Cleveland, on which the general contract has been let, will take 300 tons.

Warehouse Business.—Local warehouses report that business is continuing at a good rate, although it is somewhat less than that done in June. Prices are steady.

Bolts, Nuts and Rivets.—Business in bolts and nuts so far in July is larger than during the same number of days in June. The tonnage in rivets, however, is light, but is running about the same as in June, which showed a falling off from the preceding months. Prices are unchanged.

Plates, Shapes and Bars.—Demand for the heavy hot-rolled products is much better this month than was expected. Consumption of plates by car builders, boiler manufacturers and other leading consumers has shown no marked decline. In fact, a leading seller of these lines has booked more business in July so far than in the same number of days in June. The structural market is quiet in new lettings, but a fair amount of work is in prospect. The jail courts building in Cleveland, on which bids will soon be requested, will take 1500 to 2000 tons and the Akronia Hotel, at Akron, plans for which will be out shortly, will require a thousand tons or more. An inquiry of interest to plate manufacturers is for a small tonnage of 2 to 3 per cent nickel steel plates for the boiler shells for 12 locomotives for the Great Northern Railway. Nickel steel plates for this purpose have been extensively used by the Canadian railroads. Prices of plates, shapes and bars are steady.

Sheets.—Orders from automobile manufacturers and body builders have shown a further decline. Some sellers estimate that current shipping orders represent a drop of 25 to 35 per cent from the peak rate of May and early June. While many sheet mills still have comfortable backlogs, especially in full finished sheets, the need for new tonnage is becoming more of a factor in the common finishes and heavier gages. The weakness in blue annealed sheets, referred to a week ago, affects chiefly the heavy gages now classified as light plates. Although many of the jobbing mills are adhering to 2.20c., Pittsburgh base, for No. 10 gage, sales have been made at 2.10c. and in special instances at 2c. Light blue annealed sheets, which take a 2.35c., Pittsburgh base, are firm. On black sheets, 2.85c., Pittsburgh, is general to nearly all buyers, 2.95c. having virtually disappeared even as an asking price. Galvanized sheets are being quite generally sold at 3.60c., Pittsburgh, to consumers and at 3.50c. to jobbers.

Strip Steel.—Demand for hot-rolled and cold-rolled strip steel has slumped. Mills still have a fair amount of business in hot-rolled on their books, but some cold rollers need orders. The result is that the recent minimum price of 2.75c., Pittsburgh or Cleveland, on cold rolled is now available on lots which had been commanding a premium of $2 a ton.

Wire Products.—Specifications for wire from the automobile industry are considerably lighter. Wire nails are dull and there are some irregularities in prices.

Old Material.—In the absence of new buying by local steel mills the scrap trade is marking time. Continued high operations of the steel mills and the strength in the Pittsburgh and Youngstown markets have given the local market an undertone of strength notwithstanding the slack demand here. Two local consumers of heavy melting steel are still restricting shipments from dealers, partly because of the deliveries they are getting from Detroit by boat. Prices are unchanged.

Prices per gross ton delivered consumers' yards:

Basic Open-Hearth Grades	
No. 1 heavy melting steel	$15.00 to $15.50
No. 2 heavy melting steel	14.50 to 15.00
Compressed sheet steel	14.50 to 15.00
Light bundled sheet stampings	12.00 to 12.50
Drop forge flashings	13.00 to 13.25
Machine shop turnings	9.25 to 9.50
No. 1 railroad wrought	13.50 to 14.00
No. 2 railroad wrought	16.00 to 16.50
No. 1 busheling	13.25 to 13.75
Pipes and flues	9.00 to 9.50
Steel axle turnings	12.50 to 13.00
Acid Open-Hearth Grades	
Low phos., forging crops	17.75 to 18.00
Low phos., billet, bloom and slab crops	18.50 to 18.75
Low phos., sheet bar crops	18.00 to 18.50
Low phos., plate scrap	18.00 to 18.50
Blast Furnace Grades	
Cast iron borings	10.75 to 11.00
Mixed borings and short turnings	10.75 to 11.00
No. 2 busheling	10.75 to 11.00
Cupola Grades	
No. 1 cast	16.75 to 17.25
Railroad grate bars	11.00 to 12.00
Stove plate	12.00 to 12.50
Rails under 3 ft.	18.50 to 19.00
Miscellaneous	
Railroad malleable	18.00 to 18.50
Rails for rolling	16.25 to 16.50

Warehouse Prices, f.o.b. Philadelphia

	Base per Lb.
Plates, ¼-in. and heavier	2.70c.
Plates, ¾-in.	2.80c.
Structural shapes	2.70c.
Soft steel bars, small shapes, iron bars (except bands)	2.80c.
Round-edge iron	3.50c.
Round-edge steel, iron finished 1½ x 1½ in.	3.50c.
Round-edge steel, planished	4.30c.
Reinforc. steel bars, sq. twisted and deform.	2.60c. to 2.80c.
Cold-fin. steel, rounds and hex.	3.60c.
Cold-fin. steel, sq. and flats	4.10c.
Steel hoops	3.50c.
Steel bands, No. 12 to ¾-in. inclus.	3.30c.
Spring steel	5.00c.
*Black sheets (No. 24)	4.10c.
Galvanized sheets (No. 24)	4.85c.
Light plates, blue annealed (No. 10)	3.25c.
Blue ann'l'd sheets (No. 12)	3.40c.
Diam. pat. floor plates—	
¼-in.	5.30c.
⅜-in.	5.50c.
Rails	3.20c.
Swedish iron bars	6.60c.

*For 50 bundles or more; 10 to 49 bun., 4.10c. base; 1 to 9 bun., 4.35c. base.
†For 50 bundles or more; 10 to 49 bun., 4.95c. base; 1 to 9 bun., 5.30c. base.

Philadelphia

Steel Buying Smaller But Mill Operations High—Southern Basic Sold In Small Tonnages

PHILADELPHIA, July 23.—Despite the slackening of specifications, usual at this season, steel mill operations are maintained at a high rate. Deliveries range from two to four weeks on bars and plates, but are fairly prompt on shapes and sheets. Prices are firm except on black and galvanized sheets, which have settled about $2 a ton in recent weeks.

Although Southern pig iron continues to offer low-priced competition in this district, eastern Pennsylvania furnaces are maintaining prices at their former level. Strength in the iron and steel scrap market is largely in heavy melting steel.

Pig Iron.—Southern pig iron is freely offered at $13.50 per ton, furnace, for basic and $14.50, furnace for foundry iron, but buying continues rather limited. For barge shipment, via Norfolk, Va., sellers of Birmingham iron have quoted a rail and water rate, loaded on cars Philadelphia of $5 a ton, plus the rail rate to consumer's plant. On basic iron, quotations have been made of $19.63 and $20.13 per ton, delivered, which compares with an eastern Pennsylvania basic price of $20 per ton, furnace. A large user in this district is reported to have closed on a trial tonnage of Southern basic at about $18.50 a ton, delivered. A Pencoyd, Pa., user of basic is reported to be receiving shipment of about 5000 tons of basic iron from Birmingham. In the past week, eastern Pennsylvania pig iron producers have followed the action of eastern railroads in protesting to the Interstate Commerce Commission, reductions of rail and water rates on Southern pig iron to Atlantic Coast ports. Foundry iron demand is small with prospective buyers showing no haste in placing orders in view of the low prices quoted by Birmingham sellers. Thus far eastern Pennsylvania producers have, as a rule, maintained a minimum of $21, furnace, on foundry.

Prices per gross ton at Philadelphia:

East. Pa. No. 2, 1.75 to 2.25 sil.	$21.76 to $22.26
East. Pa. No. 2X, 2.25 to 2.75 sil.	22.26 to 22.76
East. Pa. No. 1X	22.76 to 23.26
Basic del'd east. Pa.	20.25 to 21.00
Gray forge	20.50 to 21.00
Malleable	21.25 to 21.75
Stand. low phos. (f.o.b. N. Y. State furnace)	22.00 to 23.00
Cop. b'r'g low phos. (f.o.b. furnace)	23.50 to 24.00
Va. No. 2 plain, 1.75 to 2.25 sil.	24.04
Va. No. 2X, 2.25 to 2.75 sil.	24.54

Prices, except as specified otherwise, are deliv'd Philadelphia. Freight rates: 76c. to $1.64 from eastern Pennsylvania furnaces; $4.54 from Virginia furnaces.

Bars.—Deliveries range from two to four weeks and the price is firm at 1.95c. per lb., Pittsburgh, or 2.27c., delivered Philadelphia. Mills are maintaining a high rate of operation, although since the beginning of the present quarter buying has been smaller.

Reinforcing Bars.—Low bidder for the general contract on the Ridge Avenue subway, which requires 1000 tons of bars, was the Keystone State Construction Co. About 475 tons of reinforcing bars in the Coatesville General Hospital at Coatesville, Pa., have

been awarded to the Truscon Steel Co. Rail steel bars are quoted at about 1.95c., Franklin, Pa., or Tonawanda, N. Y., or 2.27c., delivered Philadelphia, with no extra for cutting to length. Billet steel reinforcing bars are quoted at 1.95c., to 2.05c., Pittsburgh, or 2.27c. to 2.37c., delivered Philadelphia, with $5 extra for cutting to length. Occasionally the extra for cutting is omitted to meet the competition of rail steel bars.

Shapes.—Mills are well engaged, especially on the smaller sizes and deliveries range from a week to three weeks in some instances. Quotations are unchanged at 1.95c. to 2c. and occasionally 2.05c., f.o.b. nearest mill to consumer, or 2.01c. to 2.06c. and occasionally 2.11c., delivered Philadelphia.

Plates.—Buying is well distributed with the railroads and car builders particularly active. The contracts for building merchant ships and the cruisers for the Navy have not yet been formally approved, but mills are so well provided with tonnage at present that the delay is considered desirable, as the tonnage may be needed more later in the quarter than at present. A new avenue of plate consumption appears to be opening in their use for floor construction in buildings. The four-story addition to the Congressional Library in Washington requires about 200 tons of ¼-in. narrow plates. Prices are firm at 2.05c., Coatesville, or 2.15c., delivered Philadelphia.

Sheets.—Automobile body builders in this district are buying a fair tonnage of sheets and radio manufacturers have bought a substantial tonnage of deep drawing and electrical sheets and have not yet satisfied their requirements for this year. Blue annealed sheets, No. 13 gage are 2.35c. per lb., Pittsburgh, or 2.67c., delivered Philadelphia, and light plates, blue annealed, No. 10 gage are 2.20c. per lb., Pittsburgh, or 2.52c., delivered Philadelphia. Black and galvanized sheets are quoted at 2.85c., Pittsburgh, or 3.17c., Philadelphia, for black and 3.60c., Pittsburgh, or 3.92c., delivered Philadelphia, for galvanized. Concessions of about $1 a ton are sometimes obtainable on desirable orders.

Warehouse Business.—Prices are well maintained, but the volume of business this month is appreciably smaller than in June.

Imports.—In the week ended July 20, a total of 4474 tons of chrome ore arrived at this port from Portuguese Africa. Steel imports consisted of 72 tons of steel bars, 78 tons of structural shapes and 29 tons of steel bands from Belgium, 261 tons of structural shapes, 14 tons of steel bands and 13 tons of bars from France and 24 tons of billets and 27 tons of steel rods from Sweden. Scrap arrivals totaled 29 tons from the United Kingdom and 6 tons from Germany.

Old Material.—A large eastern Pennsylvania consumer has closed on upward of 10,000 tons of No. 1 heavy melting steel at $17 a ton, delivered. Supplies of No. 2 steel are not large and brokers with contracts for delivery to Conshohocken and Pencoyd, Pa., are paying up to $14.25 and $14.50 per ton, delivered, to fill their orders. Low phosphorus scrap is lacking in strength, and prices of heavy breakable cast are less firm than the market on other grades of scrap.

Prices per gross ton delivered consumers' yards, Philadelphia district:

No. 1 heavy melting steel	$16.50 to	$17.00
Scrap T rails		16.00
No. 2 heavy melting steel	12.50 to	14.25
No. 1 railroad wrought	16.00 to	16.50
Bundled sheets (for steel works)		11.50
Hydraulic compressed, new	14.50 to	15.00
Hydraulic compressed, old	12.00 to	12.50
Machine shop turnings (for steel works)	11.50 to	12.00
Heavy axle turnings (for equip.)	14.00 to	14.50
Cast borings (for steel works and roll mill)	11.00 to	11.50
Heavy breakable cast (for steel works)	15.00 to	15.25
Railroad grate bars	12.00 to	12.50
Stove plate (for steel works)	12.00 to	12.50
No. 1 low phos., hvy., 0.04% and under	22.00 to	23.00
Couplers and knuckles	19.50 to	20.50
Rolled steel wheels	19.50 to	20.50
No. 1 blast f'nace scrap	10.50 to	11.00
Wrot. iron and soft steel pipes and tubes (new specific.)		15.00
Shafting	19.00 to	19.50
Steel axles	23.00 to	23.50
No. 1 forge fire		14.00
Cast iron carwheels	16.50 to	17.00
No. 1 cast	16.50 to	17.00
Cast borings (for chem. plant)		14.50
Steel rails for rolling	16.50 to	17.00

The Wean Engineering Co., Inc., Warren, Ohio, has become the selling company in the United States and Canada for the McKay Machine Co., Youngstown, Ohio, maker of roller leveling equipment. Flinn & Dreffein Co., Chicago, is associated with the Wean company as furnace contractors and combustion engineers on continuous pack heating furnaces for sheet and tin mills.

The American Railway Tool Foremen's convention, which will be held this year at the Hotel Sherman, Chicago, Sept. 11, 12 and 13, will be featured by an exhibit in charge of the supply organization subsidiary to the association, of which supply association, C. C. Ziegler, Greenfield Tap & Die Corporation, 611 West Washington Boulevard, Chicago, is secretary.

Methods of investigating individual industrial accidents are presented in a pamphlet issued by the National Safety Council. An appendix sets forth the system used by E. I. du Pont de Nemours & Co., and a description of the court of inquiry conducted by the American Steel & Wire Co.

The first of four new sheet mills of the Continental Steel Corporation plant at Kokomo, Ind., has been started and the remainder will be put in operation shortly.

Railroad Equipment

Wabash Purchases 25 Large Freight Locomotives

PURCHASE of 25 large freight locomotives by the Wabash was the feature of the past week in the railroad equipment market. The Texas & Pacific is inquiring for 15 locomotives. The Great Northern Equipment Co. is taking bids on 300 flat cars and 300 flat car underframes. Details of the week's business follow:

Wabash has ordered 25 large freight locomotives from Baldwin Locomotive Works.

Cearense Railroad of Brazil has ordered three locomotives from Baldwin Locomotive Works.

Campbell River Timber Co. has ordered one locomotive from Baldwin Locomotive Works.

Great Northern Equipment Co. is inquiring for 300 flat cars and 300 flat car underframes.

New York, New Haven & Hartford is asking for bids on 75 coke car bodies of 40 tons capacity each.

Texas & Pacific will buy 15 Texas type locomotives.

Extra Dividend on Jones & Laughlin Stock

Jones & Laughlin Steel Corporation reports net income of $6,051,508 after deductions for Federal taxes, depreciation, depletion and bond interest, for the quarter ended June 30. Net income for the six months ended June 30 is $11,305,687, after preferred and common dividends. The balance carried to surplus in the last quarter was $3,727,273 and $7,233,538 in first half.

Regular quarterly dividends of 1¾ per cent on preferred and 1½ per cent on common stock were declared, and also an extra dividend of 1 per cent on common stock.

Cleveland engineers are planning on an engineers' day during the Cleveland Air Races and Airplane Show which is to be held the latter part of August. The program is under the joint auspices of the Cleveland Engineering Society and the aeronautic division and Cleveland section of the American Society of Mechanical Engineers. One session will be devoted to seaplane and flying-boat development.

A net loss of $61,011.56 for the second quarter was reported for the Virginia Iron, Coal & Coke Co., Roanoke, Va. The first quarter showed a profit of $33,048.15, so that the results of operations for six months ended June 30 is a net loss of $27,963.41.

Radio talks are being given by the Clipper Belt Lacer Co., over the Madison Square Garden Station, W.M.S.G., New York. These talks started on May 25 and will be put on four times a week for a period of six months.

Pacific Coast

Pipe Line Calling for 5000 Tons Placed—Structural Awards Total 7000 Tons—Rivets Active

SAN FRANCISCO, July 20 (*By Air Mail*).—Movement of steel products on the Pacific Coast shows few signs of diminishing, and bookings this week were in fair volume. An award of 5000 tons of plates for a pipe line in Vancouver, B. C., was placed, and bids have been opened on a 3700-ton riveted steel pipe line for Seattle. A number of important reinforcing steel bar projects were placed, including 675 tons for a school in San Francisco and 500 tons for a college building in Berkeley, Cal.

Considerable interest has been aroused in recent reports regarding the acquisition of the Columbia Steel Corporation by the United States Steel Corporation and the contemplated purchase by the latter company of a large industrial site near the Columbia Steel Corporation's present property in Pittsburg, Cal. Verification, however, could not be obtained.

Pig Iron.—Foundry operations are of such a character that demand for foundry iron remains more or less spotty, the majority of sales and inquiries being small. Pig iron quotations are unchanged.

Prices per gross ton at San Francisco:

*Utah basic	$25.00 to $26.00
*Utah fdy., sil. 2.75 to 3.25	25.00 to 26.00
**Indian fdy., sil. 2.75 to 3.25	25.00 to 26.00

*Delivered San Francisco.
**Duty paid, f.o.b. cars San Francisco.

Bars.—Awards of reinforcing bars were the largest of any week of the year to date and brought the total for 1929, for the first time since the early part of April, above the aggregate for the corresponding total of last year. Important bookings included 800 tons for two buildings in Berkeley, placed with the Soule Steel Co.; 370 tons for an apartment in San Francisco, secured by W. C. Hauck & Co., and close to 600 tons for two factories in San Francisco, taken by the Pacific Coast Steel Co. Although most pending inquiries are for less than 100 tons, the West Garfield Street bridge in Seattle calls for 1150 tons. Out-of-stock prices in San Francisco continue at 2.20c. a lb., base, on carload lots, with 2.60c. a lb. applying on smaller tonnages. Los Angeles out-of-stock prices are $2 a ton higher. Merchant bars continue to move in small lots only, and 2.35c. a lb., c.i.f. Coast ports, appears to be general on this class of material.

Plates.—The Vancouver Engineering Works was awarded 5000 tons of plates for a pipe line for Vancouver, B. C. Other lettings of the week included seven steel tanks, ranging in size from 65,000 to 200,000 gal., for the Southern Pacific Co., San Francisco, to be installed at various points in California and Nevada. The Western Pipe & Steel Co. took 125 tons for a siphon for a reclamation project at Vale, Ore., while the Seattle Boiler Works secured 150 tons for a burner at Klamath Falls, Ore., for the Weyerhaeuser Timber Co. Bids were opened this week on 3700 tons for a riveted steel pipe line at Seattle. Prices remain firm at 2.35c. a lb., c.i.f. Coast ports.

Shapes.—Demand for structural shapes is being well maintained, and awards this week exceeded 7000 tons. Most of these projects, however, called for lots of from 100 to 200 tons. The Virginia Bridge & Iron Co. took two bridges for the Pacific Electric Co., Los Angeles, requiring 252 tons. An apartment in San Francisco calls for 200 tons, and a sorting rack for a timber company in Oregon for 250 tons. Plain material is firm at 2.35c. a lb., c.i.f. Coast ports.

Rivets.—Activity among the plate fabricating plants on the Pacific Coast has resulted in a stream of orders for rivets, and business booked so far this year is estimated to be in excess of that entered for the entire year 1928. Prices on large rivets appear to be firm at $3.10 a 100 lb., Pittsburgh.

Cast Iron Pipe.—Only three awards were reported placed this week. The American Cast Iron Pipe Co. took 225 tons for the improvement of West Dravus Street, Seattle. Bert Noble secured 145 tons of 4 to 12-in. Class B pipe for the improvement of Fifty-fifth Street, San Diego, Cal. Newport Beach, Cal., placed 724 tons of 4 to 12-in. Class B pipe for the improvement of Lido Island with the Underground Construction Co. On 1012 tons of 4 to 12-in. Class B pipe for Pasadena, Cal., the United States Pipe & Foundry Co. and the Pacific States Cast Iron Pipe Co. were low bidders, the latter company on the 4-in. pipe. The East Bay Municipal Utility District, Oakland, Cal., has made no award, as yet, on its project calling for 2331 tons of 6 to 20-in. Class B or centrifugal pipe. Bids were opened this week on 185 tons of 4 to 12-in. Class B pipe for the improvement of Broadway, Santa Monica, Cal. Bids were also opened by Alhambra, Cal., for 360 tons of Class B pipe. San Diego will open bids on Aug. 5 for 145 tons of 4 and 6-in. Class B pipe for the improvement of Redwood Street.

Warehouse Prices, f.o.b. San Francisco

	Base per Lb.
Plates and struc. shapes	3.15c.
Soft steel bars	3.15c.
Small angles, ¼-in. and over	3.15c.
Small angles, under ¼-in.	3.55c.
Small channels and tees, ¾-in. to 2¾-in.	3.75c.
Spring steel, ⅛-in. and thicker	5.00c.
Black sheets (No. 24)	4.90c.
Blue ann'l'd sheets (No. 10)	3.80c.
Galv. sheets (No. 24)	5.30c.
Struct. rivets, ½-in. and larger	5.65c.
Com. wire nails, base per keg	$3.40
Cement c't'd nails, 100 lb. keg	3.40

Birmingham

Pig Iron Sold in East—Steel Buying Tapers But Mill Output Is Undiminished

BIRMINGHAM, July 23.—Buyers are apparently satisfied that the present base price will continue, as actual requirements are the main factor in current purchases. Buying has been in much smaller volume than was expected by furnace interests when prices were reduced for the second time, early this month. Last week's sales to district consumers were at about the same rate as in the previous week. A good portion of current business consists of spot orders from the smaller foundries. Several sales are reported made to East Coast points pending the establishment of the new combination rail and barge rates to Baltimore, Philadelphia, New York and Boston, which are scheduled to become effective Aug. 12, and it is expected that the movement of iron to those points will be important. The sale of Birmingham iron to the East so far has been of an introductory character. The Tennessee company has been shipping iron for some time to two large foundries in the East, one of which is a subsidiary company. It is reported that 15,000 tons of Birmingham iron will be shipped to the Louisville, Ky., plant of the Standard Sanitary Mfg. Co. The total number of active blast furnaces in this district remains at 17. Nine are on foundry iron, seven on basic and one on recarburizing iron.

Prices per gross ton, f.o.b. Birmingham dist. furnaces:

No. 2 fdy., 1.75 to 2.25 sil.	$14.50
No. 1 fdy., 2.25 to 2.75 sil.	15.00
Basic	14.50

Finished Steel.—A further tapering off in the volume of new business has reduced it to a point where it is not quite equal to present shipments. Operations remain at the highest rate of the year, which is only a little under capacity for most of the mills. Order books are sufficient to support production at the present gait for from three to four weeks without the addition of further tonnage. Inquiries for bars, plates and shapes, though not so brisk as two weeks ago, are still much heavier than is usual for this season. Prices are unchanged. Structural steel fabricators report several important projects in prospect for the next few weeks. New orders of the Nashville Bridge Co. include over 4000 tons for towers for a transmission line near Memphis, Tenn., 200 tons for Alabama highway bridges and 125 tons for a bridge at Aberdeen, Miss. Reinforcing bar orders are in small lots, with

a fairly satisfactory aggregate. Only one open-hearth furnace is idle out of a total of 23, as has been the case for three weeks.

Cast Iron Pipe.—A few inquiries from the Middle West were the main developments in the pressure pipe market during the past week. Included was a project at Chicago, requiring about 1600 tons, to be awarded July 23. The United States Pipe & Foundry Co. is low bidder on 2331 tons of 6 to 20-in. pipe for Oakland, Cal. This company has been awarded 20,800 ft. of 6 and 8-in. pipe for Houston, Miss. The American Cast Iron Pipe Co. has booked 200 tons for Mountain City, Tenn. The placing of about four miles of 8 to 12-in. pipe for Hollywood, Fla., has been postponed until Aug. 15. West Greenville, S. C., will open bids July 30 for 20,000 ft. of 6 and 8-in. pipe. The project at Griffin, Ga., requiring nine miles of 16 to 20-in. pipe will be awarded about Sept. 1. Shipments this month have exceeded those of the comparable period of last month, being a little better than production. Prices are steady at $37 to $38 a net ton, Birmingham.

Coke.—Foundry coke under contract is moving in fairly satisfactory volume for this season. Prices are unchanged at $5 a net ton, Birmingham.

Old Material.—Several of the larger consumers are continuing to specify much less than their usual tonnages and the market remains slow. Smaller consumers are buying small lots as needed for current requirements. Practically no cast iron scrap is being sold. Prices are unchanged but weak.

Prices per gross ton, deliv'd Birmingham dist. consumers' yards:

Heavy melting steel	$12.50
Scrap steel rails	12.50
Short shoveling turnings	9.00
Cast iron borings	9.00
Stove plate	$11.50 to 12.00
Steel axles	21.00
Iron axles	23.00
No. 1 railroad wrought	10.00 to 10.50
Rails for rolling	14.00 to 15.00
No. 1 cast	13.50
Tramcar wheels	13.00
Cast iron carwheels	12.50 to 13.00
Cast iron borings, chem.	13.50 to 14.00

St. Louis

Advances in Scrap—New Business in Finished Steel Light—Demand for Pig Iron Lags

ST. LOUIS, July 23.—Melters seem wary of the pig iron market, in view of recent reductions by the Southern makers, and most purchases are being made only for immediate needs. The St. Louis Gas & Coke Corporation sold only 1850 tons, all for third quarter shipment, including 500 tons to an Iowa jobbing foundry, 300 tons to an Illinois equipment maker and 200 tons to an Illinois melter, all foundry, and 350 tons of malleable to an Illinois concern. The local maker has made no change in its prices despite two recent reductions of 50c. a ton by Southern interests. Shipments continue heavy.

Prices per gross ton at St. Louis:

No. 2 fdy., sil. 1.75 to 2.25, f.o.b. Granite City, Ill.	$20.00
Malleable, f.o.b. Granite City	20.50
N'th'n No. 2 fdy., deliv'd St. Louis	22.16
Southern No. 2 fdy., deliv'd	18.92
Northern malleable, deliv'd	22.16
Northern basic, deliv'd	22.16

Freight rates: 75c. (average) Granite City to St. Louis; $2.16 from Chicago; $4.42 from Birmingham.

Warehouse Prices, f.o.b. St. Louis

	Base per Lb.
Plates and struc. shapes	3.25c.
Bars, soft steel or iron	3.15c.
Cold-fin. rounds, shaftings, screw stock	3.75c.
Black sheets (No. 24)	4.25c.
Galv. sheets (No. 24)	5.10c.
Blue ann'l'd sheets (No. 10)	3.45c.
Black corrug. sheets (No. 24)	4.30c.
Galv. corrug. sheets	5.15c.
Structural rivets	3.95c.
Boiler rivets	3.95c.
	Per Cent Off List
Tank rivets, ⅞-in. and smaller, 100 lb. or more	65
Less than 100 lb.	60
Machine bolts	60
Carriage bolts	60
Lag screws	60
Hot-pressed nuts, sq., blank or tapped, 200 lb. or more	60
Less than 200 lb.	50
Hot-pressed nuts, hex., blank or tapped, 200 lb. or more	60
Less than 200 lb.	50

Old Material.—For some time shipments to this market have been light, and dealers have increased prices to stimulate the movement. There is said to be a considerable short interest in No. 1 heavy melting steel, and in several other items. Consumers are showing more interest in the market, but dealers are reluctant to book business at present prices. Railroad lists, which are unusually light, follow: Chicago & Alton, 950 tons; International-Great Northern, 6926 tons; St. Louis & San Francisco, 42 carloads; Cotton Belt, 16 carloads; Nashville, Chattanooga & St. Louis, 10 carloads, and Chicago & Eastern Illinois, six carloads.

Dealers' buying prices per gross ton, f.o.b. St. Louis district:

No. 1 heavy melting or shoveling steel	$13.75 to $14.25
No. 2 heavy melting or shoveling steel	12.75 to 13.25
No. 1 locomotive tires	15.00 to 15.50
Miscel. stand.-sec. rails including frogs, switches and guards cut apart	15.75 to 16.25
Railroad springs	18.00 to 18.50
Bundled sheets	9.50 to 10.00
No. 2 railroad wrought	13.75 to 14.25
No. 1 busheling	10.00 to 10.50
Cast iron borings and shoveling turnings	9.50 to 10.00
Iron rails	15.00 to 15.50
Rails for rolling	16.25 to 16.75
Machine shop turnings	8.00 to 8.50
Heavy turnings	9.75 to 10.00
Steel car axles	19.00 to 19.50
Iron car axles	26.50 to 27.00
Wrot. iron bars and trans.	22.00 to 22.50
No. 1 railroad wrought	13.00 to 13.50
Steel rails, less than 3 ft.	17.50 to 18.00
Steel angle bars	14.25 to 14.75
Cast iron carwheels	14.50 to 15.00
No. 1 machinery cast	15.50 to 16.00
Railroad malleable	15.50 to 16.00
No. 1 railroad cast	15.00 to 15.50
Stove plate	12.50 to 13.00
Agricult. malleable	15.00 to 15.50
Relay. rails, 60 lb. and under	20.50 to 23.50
Relay. rails, 70 lb. and over	26.50 to 29.00

Coke.—A shortage of foundry coke is reported, there being an especially good demand from melters in this area. Shipments of furnace coke to district smelters continue heavy. The usual seasonal dullness prevails in the domestic coke trade.

Finished Steel.—Specifications for plates, shapes and bars are reaching the mills as contracts require, but no new business of consequence is being placed. The demand for tank plates and blue annealed sheets continues good. The American Bridge Co. got the first sizable structural order for some time, 450 tons for a Woolworth building. A number of large projects are being discussed by financial interests, but the largest definitely before the trade is a Mack Truck service station, 350 tons.

Cincinnati

Scrap Stronger—Interest in Pig Iron Lacking

CINCINNATI, July 23.—Sales of pig iron have declined noticeably, and the market generally is dull as buyers feel their way before entering the market. Such iron as has been purchased has been bought quietly in small quantities, chiefly in carload lots. Despite this lull in activity, Northern pig iron continues firm at about $18.50 base, furnace. On the other hand, Southern iron is still weak at $14.50 base, Birmingham, with strong indications that concessions on quantity orders would be granted. The Marmon Motor Car Co., Indianapolis, is inquiring for a quantity of Northern foundry iron, ranging from 2500 to 5000 tons, depending on whether the company takes material only for third quarter or for the entire second half. A Muncie, Ind., consumer is asking for 600 tons of the same grade.

Prices per gross ton, deliv'd Cincinnati:

So. Ohio fdy., sil. 1.75 to 2.25	$19.89 to $20.39
Ala. fdy., sil. 1.75 to 2.75	17.69 to 18.19
Ala. fdy., sil. 2.25 to 2.75	18.19 to 18.69
Tenn. fdy., sil. 1.75 to 2.25	17.69 to 18.19
S'th'n Ohio silvery, 8 per cent	26.89

Freight rates, $1.89 from Ironton and Jackson, Ohio; $3.69 from Birmingham.

Finished Material.—The usual seasonal recession of buying activity is being felt by district sheet mills and, consequently, backlogs are being slowly reduced. Interest in galvanized

Warehouse Prices, f.o.b. Cincinnati

	Base per Lb.
Plates and struc. shapes	3.40c.
Bars, soft steel or iron	3.30c.
New billet reinforc. bars	3.15c.
Rail steel reinforc. bars	3.00c.
Hoops	4.05c.
Bands	3.50c.
Cold-fin. rounds and hex	3.85c.
Squares	4.35c.
Black sheets (No. 24)	4.05c.
Galvanized sheets (No. 24)	4.90c.
Blue ann'l'd sheets (No. 10)	3.45c.
Structural rivets	3.85c.
Small rivets	65 per cent off list
No. 9 ann'l'd wire, per 100 lb.	$3.00
Com. wire nails, base per keg	2.85
Cement c't'd nails, base 100 lb. keg	2.85
Chain per 100 lb.	8.75
	Net per 100 Ft.
Lap-weld steel boiler tubes, 2-in.	$16.00
4-in.	33.00
Seamless steel boiler tubes, 2-in.	17.00
4-in.	34.00

sheets for roofing is increasing and is tending to offset to a small degree the sagging demand for other lines. Specialty sheets continue to command attention, as manufacturers of electrical devices, steel furniture and partitions are maintaining production at a good rate. On the other hand, demand for blue annealed sheets is off.

Coke.—Except for the sale of 5000 tons of New River foundry coke to an Illinois consumer, new business has been confined to spot shipments for immediate use. However, specifications on current contracts continue at a good rate and in better quantity than last month. Prices on by-product foundry coke, delivered in Cincinnati, will continue at $10.05 during August.

Old Material.—Although no sales of large tonnages have been reported, consumers are taking old material on commitments at a fair rate and dealers are finding it difficult to obtain good scrap to apply on contracts. Dealers are paying 25c. more a ton for heavy melting steel and No. 2 railroad wrought than a week ago. The price on bundled sheets has increased 50c. a ton, while sheet clippings are down 25c.

Dealers' buying prices per gross ton, f.o.b. cars, Cincinnati:

Heavy melting steel	$13.50 to $14.00
Scrap rails for melting	13.75 to 14.25
Loose sheet clippings	9.00 to 9.50
Bundled sheets	11.00 to 11.50
Cast iron borings	9.00 to 9.25
Machine shop turnings	8.50 to 8.75
No. 1 busheling	10.50 to 11.00
No. 2 busheling	6.75 to 7.00
Rails for rolling	14.50 to 15.00
No. 1 locomotive tires	14.25 to 14.75
No. 2 railroad wrought	13.25 to 13.75
Short rails	18.50 to 19.00
Cast iron carwheels	12.75 to 13.25
No. 1 machinery cast	19.25 to 19.75
No. 1 railroad cast	15.25 to 15.75
Burnt cast	10.25 to 10.75
Stove plate	10.25 to 10.75
Brake shoes	10.25 to 10.75
Railroad malleable	15.25 to 15.75
Agricultural malleable	14.25 to 14.75

Youngstown

Specifications Declining in Sheets, Strips and Bars, But Production Remains High

YOUNGSTOWN, July 23. — Although new business has been falling off steadily in the last two or three weeks, Valley district steel makers are still being pressed for deliveries on many products and operations have declined very little from the high rate of April and May. Curtailment in the sheet mills and, to a lesser extent, in open-hearth production has been necessitated by hot weather. Repairs to furnaces are also required from time to time, but not more than two or three of the available open-hearth furnaces in the district are usually allowed to be idle at one time and steel output is at record proportions for the summer season.

The principal declines in specifications have been in sheets and strips and more recently in bars. On sheets, however, mill backlogs are so large, even on the common finishes, that declining tonnage releases will have no effect on output for several weeks and revived automobile specifications are expected to appear before that time. Shipments to the automobile and parts makers serving the Ford and Chevrolet companies have not lessened, the decline in production by Michigan companies being confined largely to the makers of cars in the medium-priced class. On hot and cold-rolled strips backlogs have been generally reduced and business is on the hand-to-mouth basis that usually prevails at this time of the year. On bars deliveries range from two to four weeks, but better shipments are rapidly becoming possible.

The pipe business has been steadily growing more encouraging, and Youngstown companies will have an opportunity of quoting on several hundred thousand tons of line pipe in the next few weeks. Line pipe business now on company books is fairly satisfactory, but standard pipe is below expectations. The Republic Iron & Steel Co. is making shipments from the first unit of its electric-welded pipe plant in sizes up to 6⅝ in. and work is progressing rapidly on the mills that will make larger sizes. The Youngstown Sheet & Tube Co. is also experimenting on electrically-welded pipe and is reported to be making rapid progress in the development of a marketable product.

Tin mills are operating at close to physical capacity and business coming in promises to hold these schedules for several weeks.

Price weakness in sheets and strip is not generally recognized by the larger mills in the district because of their large backlogs on most products. However, business is being taken at 3.60c. and 2.85c., Pittsburgh, respectively on black and galvanized sheets and these figures are more representative of the market than higher quotations. Although prices $1 and $2 a ton under the above figures are growing more common, they are not being met by Youngstown mills, which are also holding firmly to the 2.20c. and 2.35c., Pittsburgh, quotations on light plates and blue annealed sheets. In other districts concessions of $2 a ton have appeared on these products, as well as on the 3c. price on tin mill black plate. Hot-rolled strip is steady at 1.90c. and 2c., Pittsburgh or Cleveland, and the market on cold-rolled strip is now well represented by 2.75c.

On sheet bars, billets and slabs $35 is the ruling quotation, and non-integrated mills have generally contracted for third quarter at that figure. Semi-finished steel is still rather hard to buy in the open market, although contract business is being taken care of satisfactorily.

The pig iron market is firm at $18.50, Valley, for the foundry and basic grades and $19 for malleable and Bessemer. There is little buying except in small lots, but shipments against old contracts are holding up well and furnace stocks are at the lowest point in years. The Cherry Valley stack of the Davison Coke & Iron Co. is expected to be blown in during August, and the Claire furnace of the same company will go out for relining in the near future.

The scrap market reflects the strength of the Pittsburgh district, and sales of heavy melting steel have been made during the last week at $18.50, delivered to Valley mills. Hydraulic compressed sheets are quotable at $17.50 to $18, or about 50c. a ton under No. 1 heavy melting.

Canada

Newfoundland Government Buys 11,000 Tons of Rails—100,000 Tons of Structural Work in Prospect

TORONTO, ONT., July 23.—While the Canadian pig iron markets are still affected by the summer holiday lull, more interest was manifest during the past week. No forward buying was reported, but spot demand was more active. The daily melt continues high, with many foundries operating at 100 per cent of capacity. Prices are strong in most districts, although they have been shaded in some instances on especially desirable business.

Prices per gross ton:

Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75	$24.60
No. 2 fdy., sil. 1.75 to 2.25	24.10
Malleable	24.60
Delivered Montreal	
No. 1 fdy., sil. 2.25 to 2.75	$26.00
No. 2 fdy., sil. 1.75 to 2.25	25.50
Malleable	26.00
Basic	24.50
Imported Iron, Montreal Warehouse	
Summerlee	$33.50
Carron	33.00

Structural Steel. — Demand shows general improvement. Several large bridge contracts are expected to be placed soon. A number of new building projects have been announced for which from 100 to 8000 tons of steel will be required. It is estimated that prospective structural steel work in Ontario and Quebec totals 50,000 and 60,000 tons, while for other parts of the Dominion upward of 50,000 tons is in prospect.

Cast Iron Pipe.—Sewage and waterworks developments are resulting in a growing demand for pipe. At the same time there are large prospective requirements in both steel and cast pipe in connection with oil and gas operations in this country. The Greater Vancouver Water Board, Vancouver, B. C., has awarded a contract to the Vancouver Engineering Works,

519 West Sixth Avenue, to supply seven miles of steel pipe ranging in size from 26 to 36 in. in diameter, at a cost of $292,963. The City Council, Winnipeg, Man., has placed an order with the Canada Iron Foundries, Fort William, Ont., for 3600 ft. of 6-in. pipe, 3600 ft. of 10-in. pipe and 3600 ft. of 12-in. pipe.

Rails.—In addition to the substantial rail orders recently received by the Algoma Steel Corporation, Sault Ste. Marie, Ont., and the Dominion Iron & Steel Co., Sydney, N. S., the latter company has just received an order for 11,000 tons of rails from the New Foundland Government. Other large orders are said to be in consideration by both the Canadian National Railways and the Canadian Pacific Railway.

Old Material.—Business in this market has shown some improvement, in sympathy with the betterment in the general outlook of the iron and steel industry as a whole. A few good tonnage sales were reported in heavy melting steel and turnings in the Toronto district and inquiry is more active than for several weeks. Montreal interests continue to order steel scrap in small lots, but at frequent intervals. Prices are firm but unchanged.

Dealers' buying prices:

	Per Gross Ton	
	Toronto	Montreal
Heavy melting steel	$10.00	$8.50
Rails, scrap	11.00	9.00
No. 1 wrought	10.00	12.00
Machine shop turnings	7.50	5.00
Boiler plate	7.50	6.00
Heavy axle turnings	8.00	7.50
Cast borings	7.50	5.00
Steel turnings	7.50	6.50
Wrought pipe	6.00	6.00
Steel axles	15.00	20.00
Axles, wrought iron	17.00	22.00
No. 1 machinery cast	....	17.00
Stove plate	....	13.00
Standard carwheels	....	16.00
Malleable	....	13.00
	Per Net Ton	
No. 1 mach'ry cast	$16.00	....
Stove plate	12.00	....
Standard carwheels	15.00	....
Malleable scrap	14.00	....

Boston

Pig Iron Sales Larger With Prices Showing No Strength—Scrap Values Advancing

BOSTON, July 23.—The purchase of 2000 tons by a Massachusetts valve manufacturer, 1500 tons by a Massachusetts textile machinery maker, 1000 tons by a Connecticut foundry and numerous small lots brought local pig iron sales the past week up to approximately 9000 tons, the largest total for some weeks. The valve manufacturer business was split three ways. The textile machinery business went largely to a furnace east of Buffalo, as did the 1000-ton Connecticut order. It is understood the textile manufacturer will purchase more iron this week, and there is a possibility of heater makers coming into the market shortly for several thousand tons, although they have not sent out inquiries. Irons sold the past week included Mystic, Buffalo, New York State, western Pennsylvania and Alabama. Prices are still soft, although no business at less than the equivalent of $17 a ton, base Buffalo, is reported. No. 1X iron, however, sold at the equivalent of $17.50 a ton, Buffalo, and a shade higher. Thus furnaces are not holding to 50c. differentials.

Foundry iron prices per gross ton deliv'd to most New England points:

†Buffalo, sil. 1.75 to 2.25	$21.28 to $21.78
‡Buffalo, sil. 2.25 to 2.75	21.78 to 22.28
*Buffalo, sil. 1.75 to 2.25	21.91 to 22.41
*Buffalo, sil. 2.25 to 2.75	22.41 to 22.91
East. Penn., sil. 1.75 to 2.25	24.65
East. Penn., sil. 2.25 to 2.75	25.15
Va., sil. 1.75 to 2.25	25.21
Va., sil. 2.25 to 2.75	25.71
Ala., sil. 1.75 to 2.25	21.41 to 23.27
Ala., sil. 2.25 to 2.75	21.91 to 23.77

Freight rates: $4.91 all rail from Buffalo, and $4.28 rail and water; $3.65 from eastern Pennsylvania; $5.21 all rail from Virginia; $6.91 to $8.77 from Alabama.

*All rail rate.

†Rail and water rate.

Reinforcing Steel.—The market for reinforcing steel remains quiet. Sales of billet steel bars the past week aggregated just under 300 tons. Prices are firm at 2.66½c. a lb., base, from stock. Rail steel bars are 2.26½c., base, delivered common Boston freight rate points.

Cast Iron Pipe.—The Boston Consolidated Gas Co. will shortly close on its last quarter 6 to 24-in. pipe requirements, about 2000 tons in all. For estimating purposes, Holyoke, Mass., is asking bids on 1000 tons of 6 to 12-in. pipe. Massachusetts has purchased 350 tons of pipe for various State institutions, and Bedford, Mass., 100 tons of 6-in. stock. Prices quoted openly on domestic pipe are: 4 in., $46.10 to $47.10 a ton, delivered common Boston freight rate points; 6 to 12 in., $40.10 to $41.10; 16 to 20 in., $39.10. A $3 differential is asked on Class A and gas pipe.

Warehouse Prices, f.o.b. Boston

	Base per Lb.
Plates	3.365c.
Structural shapes—	
Angles and beams	3.365c.
Tees	3.365c.
Zees	3.465c.
Soft steel bars, small shapes	3.265c.
Flats, hot-rolled	4.15c.
Reinforcing bars	3.265c. to 3.54c.
Iron bars—	
Refined	3.265c.
Best refined	4.60c.
Norway rounds	6.60c.
Norway squares and flats	7.10c.
Spring steel—	
Open-hearth	5.00c. to 10.00c.
Crucible	12.00c.
Tie steel	4.50c. to 4.75c.
Bands	4.015c. to 5.00c.
Hoop steel	5.50c. to 6.00c.
Cold-rolled steel—	
Rounds and hex	*3.55c. to 5.55c.
Spares and flats	*4.05c. to 7.05c.
Toe calk steel	6.60c.
Rivets, structural or boiler	4.50c.
	Per Cent Off List
Machine bolts	50 and 5
Carriage bolts	50 and 5
Lag screws	50 and 5
Hot-pressed nuts	50 and 5
Cold-punched nuts	50 and 5
Stove bolts	70 and 10

*Including quantity differentials.

Coke.—Consumption of by-product foundry coke is running a little ahead of July, 1928, records, and just about on a par with June, this year. The price on New England made fuel remains unchanged at $11 a ton, delivered within a $3.10 freight rate zone. Last week 4000 tons of coke from the Ruhr district of Germany, loaded at Rotterdam, arrived at Providence, R. I., for the Providence Gas Co.

Old Material.—With mills specifying against contracts more freely, with competition among shippers growing, and with most kinds of scrap in limited supply, old material prices continue to have an upward trend. The market for No. 1 heavy melting steel, scrap rails, forge flashings and skeleton is stronger than that for other kinds of scrap. Bethlehem Steel Co.'s representatives are active in the unprepared scrap market. Material bought by them is being shipped direct to consuming point instead of from the company's Quincy, Mass., shipbuilding plant, as heretofore. Owing to the fact that 75 per cent of loading crane equipment is out of commission, making it possible to load not more than 100 tons per day, indications are local scrap exporters will withdraw from the market after this week until loading facilities have been replaced in commission. One steamer is expected to finish loading 3500 tons for Danzig this week. Another 1500 ton contract will probably be held up temporarily.

Buying prices per gross ton, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$12.50 to $13.00
Scrap T rails	11.75 to 12.50
Scrap girder rails	10.50 to 11.50
No. 1 railroad wrought	12.00 to 12.50
No. 1 yard wrought	9.50 to 10.00
Machine shop turnings	6.60 to 7.10
Cast iron borings (steel works and rolling mill)	6.50 to 6.60
Bundled skeleton, long	9.50 to 10.50
Forge flashings	10.25 to 10.75
Blast furnace borings and turnings	6.00 to 6.25
Forge scrap	9.00 to 9.25
Shafting	14.00 to 14.25
Steel car axles	18.00 to 19.00
Wrought pipe 1 in. in diameter (over 2 ft. long)	9.75 to 10.00
Rails for rolling	12.50 to 13.00
Cast iron borings, chemical	10.00 to 10.25
Prices per gross ton deliv'd consumers' yards:	
Textile cast	$14.50 to $15.00
No. 1 machinery cast	15.00 to 15.25
No. 2 machinery cast	13.00 to 13.25
Stove plate	11.00 to 11.50
Railroad malleable	18.50 to 19.00

Detroit Scrap Firmer

DETROIT, July 23.—There have been no changes in prices on waste material in the district during the past week and there is a decidedly firmer tendency on blast furnace grades, with prices near the high of the range. This is probably due to the fact that the production of scrap has decreased during the present month.

Dealers' buying prices per gross ton, f.o.b. cars, Detroit:

Hvy. melting and shov. steel	$14.00 to $14.50
Borings and short turnings	9.00 to 9.50
Long turnings	8.00 to 8.50
No. 1 machinery cast	12.50 to 13.00
Automobile cast	13.00 to 13.50
Hydraul. comp. sheets	13.75 to 14.25
Stove plate	9.00 to 9.50
New No. 1 busheling	12.50 to 13.00
Old No. 1 busheling	11.00 to 11.50
Sheet clippings	8.75 to 9.25
Flashings	12.75 to 13.25

Buffalo

Pig Iron Inquiries Total 20,000 Tons—One Is for Fourth Quarter—Scrap Scarce

BUFFALO, July 23.—Inquiries totaling 20,000 tons of pig iron have been received. This volume is partially accounted for by the fact that melters who have been operating steadily through the second quarter and thus far into the third quarter on iron purchased early in the year are now running short and must come into the market. Two inquiries from the East are for 3000 tons apiece and one is for 4000. There are several for 1000 tons and similar tonnages. An order placed in Buffalo from the East was for 1600 tons of malleable and foundry. The first fourth-quarter inquiry for 250 tons of foundry has been received. The movement over the canal has been very good. Production of iron in this district is at top notch and one maker reports the heaviest first-half shipments in the history of the company. Buffalo producers believe that furnaces east of here are pretty well sold up and are hopeful of a firm price being maintained along the seaboard.

Prices per gross ton, f.o.b. furnace:

No. 2 fdy., sil. 1.75 to 2.25	$19.50
No. 2X fdy., sil. 2.25 to 2.75	20.00
No. 1 fdy., sil. 2.75 to 3.25	21.00
Malleable, sil. up to 2.25	20.00
Basic	18.50
Lake Superior charcoal	27.28

Finished Iron and Steel.—Manufacturers of reinforcing bars and fabricated structural steel report a steady demand and plenty of inquiries for small size lots, but not many for sizeable tonnages. Bids will be received soon for a post office in connection with the New York Central Terminal in East Buffalo. This building will require 400 tons of structural steel. A water reservoir at Gowanda will require 150 tons of reinforcing bars. Operation of mills is being maintained and the demand shows no sign of tapering.

Old Material.—No. 1 heavy melting steel is unusually scarce and the market is stronger. There has been some purchasing at $17.25, but no large tonnages. There have been a few purchases of No. 1 machinery cast at $15.75 to $16, and an inquiry is out for 2000 tons of stove plate. This consumer wants to buy at about $12.50, but dealers believe the material cannot be had under $13. Railroad lists went to Pittsburgh at a price of $19, Buffalo. There is a strong demand from Weirton for No. 2 heavy melting steel, and dealers are offering $14.25 to $14.50 on old orders here. In one instance $14.75 was paid. Dealers are paying $10 for machine shop turnings on one order, but as the material is taken only on an analysis basis shipments are not being freely made. One small purchase of stove plate is reported at $13. Demand for specialties has picked up, but quite a number of unfilled orders are out and dealers are reluctant to take on new. There has been a decided drop in the production of scrap and demand has been maintained. A few sales of cast iron borings at $11.50 are reported. One of the largest consumers in the district continues to bring in hydraulic sheets from Detroit at the rate of two boatloads a week.

Warehouse Prices, f.o.b. Buffalo

	Base per Lb.
Plates and struc. shapes	3.40c.
Soft steel bars	3.30c.
Reinforcing bars	2.95c.
Cold-fin. flats, sq. and hex.	4.45c.
Rounds	3.95c.
Cold-rolled strip steel	5.85c.
Black sheets (No. 24)	4.20c.
Galv. sheets (No. 24)	4.85c.
Blue ann'l'd sheets (No. 10)	3.50c.
Com. wire nails, base per keg	$3.60
Black wire, base per 100 lb.	3.75

Prices per gross ton, f.o.b. Buffalo consumers' plants:

Basic Open-Hearth Grades:		
No. 1 heavy melting steel	$17.00 to	$17.25
No. 2 heavy melting steel	14.75 to	15.00
Scrap rails	16.50 to	17.00
Hydraul. comp. sheets	14.50 to	14.75
Hand bundled sheets	12.00 to	12.50
Drop forge flashings	14.25 to	14.50
No. 1 busheling	15.50 to	16.50
Hvy. steel axle turnings	14.00 to	14.50
Machine shop turnings	7.50 to	7.75
No. 1 railroad wrought	13.00 to	13.50
Acid Open-Hearth Grades:		
Knuckles and couplers		19.00
Coil and leaf springs		19.00
Rolled steel wheels		19.00
Low phos. billet and bloom ends	20.00 to	20.50
Electric Furnace Grades:		
Short shov. steel turnings	12.00 to	12.50
Blast Furnace Grades:		
Short mixed borings and turnings	11.00 to	11.50
Cast iron borings	11.00 to	11.50
No. 2 busheling	10.00 to	10.50
Rolling Mill Grades:		
Steel car axles	18.75 to	19.25
Iron axles	21.00 to	22.00
Cupola Grades:		
No. 1 machinery cast	16.00 to	17.00
Stove plate	12.50 to	13.00
Locomotive grate bars	12.50 to	13.00
Steel rails, 3 ft. and under	19.00 to	19.50
Cast iron carwheels	14.00 to	14.50
Malleable Grades:		
Industrial	18.50 to	19.00
Railroad	18.50 to	19.00
Agricultural	18.50 to	19.00
Special Grades:		
Chemical borings	12.50 to	13.50

Sustained Industrial Output Forecast by Statisticians

"The past half year established a new high record in industrial production and trade in the United States, and the current rate should continue without serious let-up for some time to come," according to the July report of the Conference of Statisticians in Industry, operating under the auspices of the National Industrial Conference Board, New York. "This achievement is all the more remarkable because it was brought about in the face of extremely unfavorable money conditions, an unsettled agricultural situation, a decline in building construction and a depressed condition in the hide and leather industries."

The report emphasizes especially the favorable balance between production and consumption. "So far this year a very large industrial output has been absorbed by what seems to be an insatiable consumer demand. Commodity stocks on the whole have actually been on the decrease. In spite of the high tempo of production, costs have apparently remained stationary or declined, for net earnings have increased faster than gross income. No important signs of overproduction have as yet appeared."

Although the decline in building construction continues, it appears to be centered, according to the report, chiefly in the larger cities and has affected mainly residential building. The recovery of agricultural prices is pointed to by the report as likely to convert a hitherto unfavorable factor into a stabilizing influence for continued industrial prosperity.

More Steel Castings Made in Half-Year

WASHINGTON, July 23.—Orders for commercial steel castings in June totaled 94,559 tons, representing 65 per cent of the monthly capacity of 145,700 tons of the 127 concerns reporting to the Department of Commerce. This compares with 113,329 tons, or 78 per cent of capacity, for May. Production was 115,411 tons, or 79 per cent of capacity, against 127,189 tons or 87 per cent of capacity in May.

Of the June orders, 35,425 tons was for railroad specialties, being 52 per cent of that class of capacity and 59,134 tons was for miscellaneous castings, representing 76 per cent of such capacity. For the six months ended June, orders totaled 723,292 tons, or 83 per cent of capacity compared with 509,268 tons, or 58 per cent of capacity, for the corresponding period of last year.

June production was made up of 55,493 tons of railroad specialties, or 82 per cent of such capacity, and 59,918 tons of miscellaneous castings, or 77 per cent of such capacity. Production for the first six months of 1929 aggregated 670,685 tons, against 527,265 tons for the corresponding period of 1928. The gain in railroad specialties was much heavier than in the miscellaneous group. It was 43 per cent—from 204,841 tons to 293,120 tons—compared with 17 per cent—from 322,424 tons to 377,565 tons—for miscellaneous castings.

Exhibits of metal products will be shown at the Leipzig Trade Fair at Leipzig, Germany, Aug 25 to 31 inclusive. America's expanding world trade has been responsible for increased participation in the fairs during the past few years. Information concerning the fair can be obtained from American headquarters at 11 West Forty-Second Street, New York.

Non-Ferrous Metal Markets

Tin Sales Heavy, Copper More Active, Zinc Prices Advance

NEW YORK, July 23.

Tin.—The past week was marked by increased buying of Straits tin, total sales having amounted to about 2800 tons. This tonnage put the week among the highest of the year. Demand was about equally divided among dealers and consumers, and deliveries over the remainder of 1929 were specified by most customers. The market was quiet early in the week until a consumer bought 500 tons. This transaction gave impetus to further active trading, which has prevailed the last few days. While business has been of substantial volume, there have been no developments of outstanding interest. The demand for Straits tin is reflected in prices. Quotations have remained fairly steady all week and spot Straits tin was firm today at 47.25c., New York. The London market has been moderately active and prices have not changed much in the past week. Spot standard is quoted at £212 10s., future standard at £216 5s. and spot Straits at £216 5s. An interesting feature is that full prices were paid in the primary market at Singapore, which was quoted today at £220 10s.

Copper.—An upward turn in demand was discernible the past week and indications are that buying on a more liberal scale will continue during the remainder of July. Sales this morning totaled about 1200 tons and average daily bookings in the last seven days have been more than 1100 tons, or twice those of the preceding week. Practically all of the gain has been confined to foreign users, for domestic consumers still are refraining from buying, except in extremely meager lots. Producers, however, are confident that the time is rapidly drawing near when domestic companies will be forced into the market from the sheer necessity of meeting immediate needs. Although the increased sales have bolstered the market, it must be remembered that demand still is far below normal. Producers must book about 2000 tons daily in order to find an outlet for normal accumulation of stocks. It is evident, therefore, that business during July has been far from satisfactory, even though the month is ending more satisfactorily than it began. Prices are firm and unchanged, with

THE WEEK'S PRICES. CENTS PER POUND FOR EARLY DELIVERY

	July 23	July 22	July 20	July 19	July 18	July 17
Lake copper, New York	18.12½	18.12½	18.12½	18.12½	18.12½	18.12½
Electrolytic copper, N. Y.*	17.75	17.75	17.75	17.75	17.75	17.75
Straits tin, spot, N. Y.	47.25	47.25	.....	47.37½	46.42½	47.00
Zinc, East St. Louis	6.80	6.80	6.80	6.80	6.80	6.80
Zinc, New York	7.15	7.15	7.15	7.15	7.15	7.15
Lead, St. Louis	6.55	6.55	6.55	6.55	6.55	6.55
Lead, New York	6.75	6.75	6.75	6.75	6.75	6.75

*Refinery quotation; price ¼c. higher delivered in the Connecticut Valley.

Prices on rolled non-ferrous products are unchanged from those prevailing one week ago.

List Prices, Per Lb., f.o.b. Mill

On Copper and Brass Products, Freight up to 75c. per 100 Lb. Allowed on Shipments of 500 Lb. or Over

Sheets—
- High brass ..... 23.25c.
- Copper, hot rolled ..... 26.75c.
- Zinc ..... 10.25c.
- Lead (full sheets) ... 11.00c. to 11.25c.

Seamless Tubes—
- High brass ..... 28.25c.
- Copper ..... 29.25c.

Rods—
- High brass ..... 21.25c.
- Naval brass ..... 24.00c.

Wire—
- Copper ..... 19.87½c.
- High brass ..... 23.75c.

Copper in Rolls ..... 26.75c.
Brazed Brass Tubing ..... 30.87½c.

Aluminum Products in Ton Lots

The carload freight rate is allowed to destinations east of Mississippi River and also to St. Louis on shipments to points west of that river.

- Sheets, 0 to 10 gage, 3 to 30 in. wide ..... 33.00c.
- Tubes, base ..... 42.00c.
- Machine rods ..... 34.00c.

Chicago Warehouse

(Prices Cover Trucking to Customers' Doors in City Limits)

Sheets—	Base per Lb.
High brass	23.25c.
Copper, hot rolled	27.75c.
Copper, cold rolled, 14 oz. and heavier	30.00c.
Zinc	10.00c.
Lead, wide	11.90c.
Seamless Tubes—	
Brass	28.25c.
Copper	29.25c.
Brass Rods	21.25c.
Brazed Brass Tubes	31.00c.

New York or Cleveland Warehouse

Delivered Prices, Base Per Lb.

Sheets—	
High brass	21.12½c. to 22.12½c.
Copper, hot rolled, Base sizes	27.75c. to 28.75c.
Copper, cold rolled 14 oz. and heavier, base sizes	30.00c. to 31.00c.
Seamless Tubes—	
Brass	26.00c. to 27.00c.
Copper	29.12½c. to 30.12½c.
Brazed Brass Tubes	29.12½c. to 30.12½c.
Brass Rods	18.87½c. to 19.87½c.

New York Warehouse

Delivered Prices, Base Per Lb.

Zinc sheets (No. 9), casks	10.50c. to 11.00c.
Zinc sheets, open	11.50c. to 12.00c.

Metals from New York Warehouse

Delivered Prices, Per Lb.

Tin, Straits pig	48.50c. to 49.50c.
Tin, bar	50.50c. to 51.50c.
Copper, Lake	19.50c.
Copper, electrolytic	19.25c.
Copper, casting	19.00c.
Zinc, slab	7.75c. to 8.25c.
Lead, American pig	7.50c. to 8.00c.
Lead, bar	9.50c. to 10.00c.
Antimony, Asiatic	10.50c. to 11.00c.
Aluminum No. 1 ingots for remelting (guaranteed over 99% pure)	25.00c. to 26.00c.
Alum. ingots, No. 12 alloy,	24.00c. to 25.00c.
Babbitt metal, commercial grade,	30.00c. to 40.00c.
Solder, ½ and ½	31.00c. to 32.00c.

Metals from Cleveland Warehouse

Delivered Prices Per Lb.

Tin, Straits pig	52.00c
Tin, bar	54.00c
Copper, Lake	19.50c.
Copper, electrolytic	19.25c.
Copper, casting	18.75c.
Zinc, slab	7.75c. to 8.00c.
Lead, American pig	7.50c. to 7.75c.
Lead, bar	9.75c.
Antimony, Asiatic	16.00c.
Babbitt metal, medium grade	18.75c.
Babbitt metal, high grade	56.50c.
Solder, ½ and ½	31.75c.

Old Metals, Per Lb., New York

Buying prices represent what large dealers are paying for miscellaneous lots from smaller accumulators and selling prices are those charged customers after the metal has been properly prepared for their uses.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	14.50c.	16.00c.
Copper, hvy. and wire	14.25c.	15.75c.
Copper, light and bottoms	12.50c.	13.50c.
Brass, heavy	8.50c.	9.50c.
Brass, light	7.50c.	8.50c.
Hvy. machine composition	11.50c.	12.75c.
No. 1 yel. brass turnings	9.50c.	10.25c.
No. 1 red brass or compos. turnings	11.25c.	12.25c.
Lead, heavy	5.25c.	5.75c
Lead, tea	4.25c.	5.25c.
Zinc	3.50c.	4.25c.
Sheet aluminum	14.00c.	16.00c.
Cast aluminum	12.25c.	14.25c.

electrolytic copper quoted at 18c., delivered in the Connecticut Valley, and at 18.30c., c.i.f. usual European ports. Lake copper is steady at 18c. to 18.12½c., delivered.

Zinc.—At the beginning of the week producers sold considerable tonnages of prime Western zinc at 6.70c., East St. Louis, and then raised the price to 6.80c. All sellers are now quoting on the latter basis. The bulk of the week's business, of course, was done prior to the advance, and therefore sales the past few days have been somewhat light.

Lead.—Considerable buying was reported the past week, with total sales in the United States approximating 12,000 tons. During the middle of the week there was a slight drop in quotations to 6.52½c., St. Louis, but later the market recovered its strength and producers are now holding to 6.55c. The American Smelting & Refining Co. is asking 6.75c., New York.

Antimony.—The crisis in Chino-Russian relations which developed the past week precipitated a rush of consumer buying of Chinese metal. The result has been a general firming up of prices, with spot selling at 8.75c. and futures at 8.62½c., duty paid, New York.

Nickel.—Ingot nickel is selling at 35c. a lb., shot nickel at 36c. and cathodes of electrolytic nickel at 35c.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is priced at 23.90c. a lb., delivered.

Non-Ferrous Metals at Chicago

CHICAGO, July 23.—Prices have advanced on all metals except copper and lead. Sales are in fair volume and releases against old orders are liberal. The old metal market is steady and moderately active.

Prices per lb., in carload lots: Lake copper, 18.50c.; tin, 48c.; lead, 6.65c.; zinc, 6.90c.; in less-than-carload lots, antimony, 9.62½c. On old metals we quote copper wire, crucible shapes and copper clips, 14c.; copper bottoms, 11.50c.; red brass, 11.50c.; yellow brass, 8c.; lead pipe, 4.50c.; zinc, 3.25c.; pewter, No. 1, 24.50c.; tin foil, 26c.; block tin, 36c.; aluminum, 12.87½c.; all being dealers' prices for less-than-carload lots.

New Trade Publications

Wrought Iron—Mesker Brothers Iron Co., St. Louis. Treatise on wrought iron, describing metal sash of this material and the reasons why it is immune to progressive corrosion. Wrought iron sash made by this company may be had in center-pivoted or projected types. The sections are exceptionally heavy, being 1½ in. deep and weighing more than 1 lb. a foot.

Valves.—Homestead Valve Mfg. Co., Coraopolis, Pa. Catalog of 52 pages, identified as catalog No. 35, contains information and illustrations of various types of valves manufactured by the company. Features shown for the first time are 8-in. and 10-in. straightway valves, 12-in. three-way valves and a special two-way protected seat hydraulic operating valve, which may be used as a spray valve or as a tube tester relief valve. To illustrate the company's ability to handle special engineering and industrial requirements, a complicated type of cast steel valve designed to meet unusual pressure and temperature requirements is shown.

Unit Heater.—Young Radiator Co., Racine, Wis. The Young unit heater in a recirculating box is described in a four-page circular. This is a particularly interesting development for automobile factories, garages, warehouses and machine shops.

Furnace Construction.—Standard Arch Co., Frostburg, Md. Booklet of 20 pages illustrating and describing an arch suspended roof, flat suspended roof and sectional supported sidewall construction for furnaces of either the industrial or the boiler type, and for a wide variety of fuels. Methods of installation and repair are detailed.

Refractories.—Charles Taylor Sons Co., Cincinnati. Booklet of four pages describing Tayco X refractories for special furnace requirements. Strength at high temperatures is stressed.

Ball Bearings.—New Departure Mfg. Co., Bristol, Conn. Loose-leaf pages of engineering reference book, general industrial edition. These cover 26 pages with an index and introduction. They are illustrated. A considerable amount of tabular matter is included.

Piling Case Goods.—Revolvator Co., 352 Garfield Avenue, Jersey City. Bulletin 85A, illustrated, shows the use of portable stacking elevators for putting boxes of goods into storage and taking them out again.

Locomotive Cranes.—Link-Belt Co., 910 South Michigan Avenue, Chicago. Booklet of 48 pages describing cranes, shovels and drag lines operated by electric motor or by steam, gasoline or Diesel engines. Capacities are from ¾ yd. to 2 yd. Crawler cranes and shovels are featured.

Water-Level Indicator.—Combustion Engineering Co., 200 Madison Avenue, New York. Folder of four pages illustrating and describing a water-level indicator for boilers, which is easily readable from the floor, regardless of the height of the boiler.

Floodlight.—Crouse-Hinds Co., Syracuse, N. Y. Bulletin 2134 of four pages illustrates and describes a floodlight for universal service, either industrial or otherwise.

Silent Chain Drives.—Ramsey Chain Co., Albany, N. Y. Catalog of 88 pages, profusely illustrated, describing a line of chain drives for application to all types of machinery. The illustrations are largely drawn from widespread installations. Tabular matter gives dimensions and list prices for a considerable variety of equipment.

Mechanical Stokers.—American Engineering Co., Philadelphia. Pamphlet of 16 pages illustrating and describing Taylor stokers, with particular reference to units going into the Delray No. 3 station of the Detroit Edison Co.

Motor-Generator Set.—General Electric Co., Schenectady, N. Y. Bulletin GEA-394A covers in two pages a small induction motor-generator set obtainable in sizes from ⅞ kw. to 35 kw. and giving 125 or 250-volt direct current.

Reinforcing Steel

Lettings Total 5500 Tons And Inquiries Are Light

REINFORCING steel lettings the past week totaled only 5500 tons, consisting mostly of miscellaneous jobs ranging from 100 to 300 tons. Inquiries for about 1800 tons were among the smallest of the year. They included 700 tons for a plant at Tarrytown, N. Y., for the Chevrolet Motor Co.

SAYREVILLE, N. J., 200 tons, Eastern New Jersey Power Co., to Truscon Steel Co.

COATESVILLE, PA., 475 tons, Coatesville General Hospital, to Truscon Steel Co.

CINCINNATI, 200 tons, sewer construction, to West Virginia Rail Co.

GRAND RAPIDS, MICH., 800 tons, sewage treating plant, to an unnamed bidder.

GRAND TRUNK RAILROAD, 500 tons, grade separation work at Pontiac, Mich., to Jones & Laughlin Steel Corporation.

DES MOINES, IOWA, 300 tons, Montgomery Ward Co., to Sheffield Steel Corporation.

PHOENIX, ARIZ., 168 tons, paving Douglas-Rodeo Highway, to unnamed bidder.

SAN FRANCISCO, 277 tons, factory, Howard and Montgomery Streets, to Pacific Coast Steel Co.

SAN FRANCISCO, 287 tons, factory, Yosemite and Lane Streets, to Pacific Coast Steel Co.

SAN FRANCISCO, 370 tons, apartment building, O'Farrell and Leavenworth Streets, to W. C. Hauck & Co.

SAN FRANCISCO, 675 tons, school, Twenty-ninth and Geary Streets, to Pacific Coast Steel Co.

HAYWARD, CAL., 150 tons, warehouse for California Conserving Co., to Pacific Coast Steel Co.

BERKELEY, CAL., 500 tons, Giannini Hall, University of California, to Soule Steel Co.

BERKELEY, 300 tons, dormitory, Bancroft and Piedmont Avenue, to Soule Steel Co.

SANDPOINT, WASH., 150 tons, barracks, to Northwest Steel Rolling Mills.

OLYMPIA, WASH., 250 tons, highway work, to Northwest Steel Rolling Mills.

OLYMPIA, 200 tons, highway work, to Pacific Coast Steel Co.

PORTLAND, ORE., 100 tons, highway work, to Northwest Steel Rolling Mills.

Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

TARRYTOWN, N. Y., 700 tons, plant addition for Chevrolet Motor Co.

GOWANDA, N. Y., 150 tons, water reservoir for village.

PHILADELPHIA, 1000 tons, Ridge Avenue subway; Keystone State Construction Co., low bidder for general contract.

CLEVELAND, 300 tons, clothing factory for Richman Brothers.

CHICAGO, tonnage not stated, Gateway theater; Rapp & Rapp, architects.

TACOMA, WASH., 290 tons, cold storage plant; bids being taken.

SAN FRANCISCO, 300 tons, Shell Oil Building; bids being taken.

American Hoist & Derrick Co., St. Paul, Minn., manufacturer of hoisting machinery, has removed its San Francisco office to 5515 Doyle Ave., Emeryville, Oakland, Cal. Boyd Nixon continues in charge.

PERSONAL

HAROLD W. SCHROEDER has been appointed district sales manager at New York for the Wheeling Steel Corporation, succeeding C. E. Scofield, who died July 9. Mr. Schroeder was born in Montclair, N. J., in 1894 and was graduated from Harvard University in 1915 with the bachelor of science

H. W. SCHROEDER

degree. He worked for several years in the Steubenville, Ohio, mill of the LaBelle Iron Works, and in July, 1919, became associated with the New York sales office of that company. When the LaBelle company merged with the Wheeling Steel Corporation in 1921, Mr. Schroeder continued in the New York office of the consolidated companies, in 1925 being appointed manager of the export department. In 1927 he added to his work the duties of assistant manager of sales for the New York district. In conjunction with his activities as district sales manager he will continue as manager of the export department, in which capacity he has charge of all of the company's foreign sales.

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HARRY A. BLACK, president, Black Hardware Co., Galveston, Tex.; HAROLD C. SMITH, president, Illinois Tool Works, Chicago; FREDERICK M. FEIKER, managing director, Associated Business Papers, Inc., New York, and ALFRED REEVES, general manager, National Automobile Chamber of Commerce, New York, are members of a committee of the Chamber of Commerce of the United States to assist trade groups in relation to trade association activities.

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F. A. WEYMOUTH, for a number of years engineer of tests of the former Maryland Steel Co., Sparrows Point, Md., and later sales metallurgist, Bethlehem Steel Co., has been appointed chief metallurgist of the Colorado Fuel & Iron Co., Pueblo, Colo.

HAROLD S. FALK, vice-president and works manager of the Falk Corporation, Milwaukee, has been appointed chairman of the committee on industrial education of the National Metal Trades Association. During the last seven years he has been chairman of the apprenticeship committee of the Milwaukee branch of the National Metal Trades Association and under his direction the number of apprentices in the Milwaukee district has grown from 460 to well over 1000. Mr. Falk is also a member of the committee on education and training for industries of the American Society of Mechanical Engineers.

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ADOLFO PRIETO, president, Monterey Iron & Steel Co., Monterey, Mexico, sailed from New York July 19 on the Alfonso XIII for Spain. He spent several days in New York as the guest of WILLIAM G. MOLER, New York representative of the Monterey company. Mr. Prieto was also entertained by the Mexican Chamber of Commerce of the United States in New York. He is president of La Victoria, one of the largest cotton and woolen mills in Mexico, and is director of industrial, financial and commercial institutions, including the Bank of Mexico.

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J. C. WILLIAMS, vice-president and general manager, Weirton Steel Co., Weirton, W. Va., sailed on July 15 for a six-weeks vacation in Europe.

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W. K. STAMETS, Pittsburgh machinery dealer, is returning this week from a three-months tour of Europe.

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J. S. ELVERSON, who for more than 25 years has specialized in chilled iron casting work, has been honored by the Fuller Lehigh Co., Fullerton, Pa., which has adopted the trade name Elverite as a designation for its chilled iron products. Mr. Elverson is the Fuller Lehigh Co.'s metallurgist. After his graduation from the University of Pennsylvania in 1887, he worked for a number of years in ore surveys, was ore agent for the Crane Iron Works, and later president of the Catasauqua Mfg. Co., manager of the Oxford mines and furnaces of Empire Steel & Iron Co. and president of the Lehigh Foundry Co.

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E. A. WEAVER, heretofore district manager of the Boston office of the Surface Combustion Co., has been transferred to the home office at Toledo. He will be succeeded by JOHN R. WALTMAN.

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E. P. DILLON, since 1918 general manager of the Research Corporation of New York, has been appointed vice-president and associate engineer of the E. Y. Sayer Engineering Corporation, New York. He has been engaged in power plant design and construction work since his graduation from the University of Colorado in 1899.

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WALTER M. SUTTON, formerly in charge of the St. Louis office of the W. A. Jones Foundry & Machine Co., Chicago, has been appointed manager of the Pittsburgh office of the company.

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BENJAMIN DIXON, who has been sales manager of the Industrial Works of Bay City, Mich., has become district sales manager of the Detroit and Chicago offices of the Ohio Locomotive Crane Co., Bucyrus, Ohio. He will make his headquarters in Detroit.

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E. G. CRAIG has been placed in charge of the New York office, 342 Madison Avenue, of the Hevi Duty Electric Co., Milwaukee.

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THOMAS L. THOMAS, formerly vice-president of the McKay Machine Co., Youngstown, Ohio, will take an executive position with the Wean Engineering Co., Inc., Warren, Ohio, which recently arranged to handle sales exclusively for the iron and steel industry for the McKay Machine Co.'s roller leveling equipment.

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H. S. RAWDON has taken up his duties as chief of the division of metallurgy, Bureau of Standards, Washington, succeeding Dr. H. W. GILLETT, who resigned to become director of the Battelle Memorial Institute, Columbus, Ohio. Mr. Rawdon has been in charge of the section of optical metallurgy at the Bureau of Standards.

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C. W. NIXON, formerly assistant to the general manager of the Central Foundry Co., Holt, Ala., has been named manager of operations of the southern plants of the company, with headquarters at Bessemer.

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E. K. MILLER has resigned as superintendent of the Fairfield blast furnaces of the Tennessee Coal, Iron & Railroad Co. He has been succeeded by G. M. HARRIS, formerly assistant superintendent.

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WILMER C. HANSON, who was formerly vice-president of W. Tyrie Stevens, Inc., New York, has opened his own office at 30 Church Street, New York, as export manager, specializing in engineering and construction machinery and equipment.

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JESSE GURNEY VINCENT, vice-president of engineering, Packard Motor Car Co., received the honorary degree of master of engineering from the University of Michigan at the commencement exercises on June 17.

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RAY C. CROUCH, mechanical engineer, Riter-Conley Mfg. Co., Pitts-

burgh, has become works manager of Reeves Brothers Co., Birmingham.

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JOHN A. ROSS, JR., professor of mechanical engineering, Clarkson College of Technology, Potsdam, N. Y., has been appointed to the newly created position of dean of administration.

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E. J. SCHWANHAUSSER, assistant manager of the Harrison works, Worthington Pump & Machinery Corporation, is taking a combined business and pleasure trip through Europe.

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ROBERT K. PLUMMER, who has been in charge of the Indianapolis office of Gears & Forgings, Inc., Cleveland, has been made assistant sales manager of the company. GEORGE W. DAVIS, formerly of the Chicago office, has been transferred to Indianapolis as district manager.

Ohio Foundrymen To Take Boat Trip

If a sufficient number of advance reservations are received, the Ohio Foundries Association, Penton Building, Cleveland, will hold its 1929 convention on an Ohio River boat. The plan is to leave from Cincinnati shortly after Sept. 15 for a trip to Ashland Ky., and return. The cost of the trip will be $30 a person. Arrangements will be made to visit a plant during the stop at Ashland.

Obituary

JOHN S. TURNER, since 1904 a member of the sales organization of the Pressed Steel Car Co., died on July 15 at his home in Brooklyn, aged 70 years. He spent about 25 years in the employ of various railroads. In 1901 he entered the sales department of the Standard Coupler Co., and a few years later joined the New York sales organization of the Pressed Steel Car Co.

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HARRIS BOTWINIK, president, Botwinik Brothers, Inc., New Haven, Conn., died July 12.

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THOMAS E. MURRAY, for years a vice-president of the New York Edison Co. and head of an engineering firm of his own name, an inventor of note largely in the electrical field and a man identified particularly with the engineering of central station power plants, died of heart disease at his home at Wickapogue, L. I., July 21, aged 68 years.

Examinations are to be held by the Civil Service Commission for associate and assistant metallurgists. The entering salaries are, respectively, $3,200 and $2,600 a year. Applications will close Aug. 28. Full information may be obtained from the commission, at Washington, or at the post office or custom house in any city.

Non-ferrous Meetings for Metal Congress Week

The Institute of Metals Division of the American Institute of Mining and Metallurgical Engineers has announced papers to be presented during its annual fall meeting at Cleveland in the week of Sept. 9 during the National Metal Congress. Simultaneously with this meeting of the Institute of Metals will be presented programs by four other national technical societies, including the American Society for Steel Treating, the American Welding Society and the iron and steel divisions of the American Institute of Mining and Metallurgical Engineering and the American Society of Mechanical Engineers.

The papers to be presented include:

Metallography of Commercial Thorium, by E. S. Davenport, Westinghouse Lamp Works, Bloomfield, N. J.

The System Cadmium-Mercury, by Robert F. Mehl and Charles S. Barrett, Naval Research Laboratory, Anacostia, D. C.

Crystal Structure of the Alpha Copper-Tin Alloys, by Robert F. Mehl and Charles S. Barrett.

Cold Working of Metals, by R. L. Templin, Aluminum Co. of America, New Kensington, Pa.

Eutectic Composition of Copper and Tin, by G. O. Hiers and G. P. deForest, National Lead Co., Research Laboratory, Brooklyn, N. Y.

Effect of Alloying on the Permissible Fiber Stress in Corrugated Zinc Roofing, by E. A. Anderson, New Jersey Zinc Co., Palmerton, Pa.

Determining the Orientation of the Crystal in Rolled Metal from X-Ray Patterns Taken by the Monochromatic Pinhole Method, by Wheeler P. Davey, C. C. Nitchie and M. L. Fuller, New Jersey Zinc Co., Palmerton, Pa.

Metal Recoveries in Secondary Aluminum Practice, by Dr. R. J. Anderson, Fairmont Mfg. Co., Fairmont, W. Va.

Reclaiming Non-Ferrous Scrap Metals at Metal Manufacturing Industries, by Francis N. Flynn, Milwaukee.

Manufacture of Wire Bars from Secondary Copper, by W. A. Scheuch and J. Walter Scott, Western Electric Co., Hawthorne Station, Chicago.

Secondary Bronze, by H. M. St. John, Detroit Lubricator Co., Detroit.

Battery Lead, by F. F. Colcord, U. S. S. Lead Refinery, New York.

Reclaiming White Metal Waste, by Mr. Potter, Federal Mogul Corporation.

Cuppy Wire, by Mr. Remmers, Western Electric Co., Hawthorne Station, Chicago.

Scrapped 1700 Machines in Rebuilding Business

"When we put our house in order, business came back," says Col. F. H. Payne, President Greenfield Tap & Die Corporation, Greenfield, Mass., in an article in the July issue of the Executives Service Bulletin, published by the Metropolitan Life Insurance Co., New York. Colonel Payne says in this article that when the break in business came in the fall of 1920 the Greenfield Tap & Die Corporation decided to revamp its entire plant. Since that time more than 1700 machines of various types have been scrapped and about $2,000,000 has been spent on new buildings and equipment.

"We were facing a period of lean business some years ago," says Colonel Payne. "That spurred us on —made us go in for a costly program of reconstruction. The results have shown that we were right. It pays to go at a job of house cleaning as thoroughly as possible and there is never an end to it because American initiative never stands still. We did not miss the 1700 machines that we threw away when we saw that our real job was ahead of us."

June Sheet Production Far Below May

Production and shipments of steel sheets by independent makers in June dropped sharply from the high record of May, according to the monthly report of the National Association of Flat Rolled Steel Manufacturers. Production amounted to 337,841 net tons, compared with 393,430 tons during May. Shipments were 347,989 tons, compared with 392,336 tons in the previous month.

Sales, which amounted to 307,911 tons, showed a good gain over the 279,783 tons of May, which was more than 100,000 tons below April. With smaller shipments and heavier sales, the unfilled tonnage declined much less sharply, as sales were within about 40,000 tons of shipments. The mills still had a large tonnage of unfilled orders on their books July 1. The June report and comparisons, in net tons, follow:

	June	May	April
Total number of mills	722	722	722
Capacity per month	451,125	502,600	482,000
Percentage reporting	67.8	67.6	67.6
Sales	307,911	279,783	398,206
Production	337,841	393,430	375,256
Shipments	347,989	392,336	377,274
Unfilled orders	676,568	713,568	835,801
Unshipped orders	111,333	119,535	121,164
Unsold stocks	52,274	48,334	54,142
Percentages of Capacity			
Sales	100.6	82.4	122.3
Production	110.4	115.8	115.2
Shipments	113.7	115.5	115.9
Unfilled orders	221.1	210.1	256.8
Unshipped orders	36.4	35.2	37.2
Unsold stocks	17.1	14.2	16.6

Manganese Producers Meet in September

The annual convention of the American Manganese Producers Association will be held at the Mayflower Hotel, Washington, Sept. 9 and 10. A review of the industry will be presented. All persons interested in the development of domestic manganese are expected to be present. Harold A. Pumpelly, Metropolitan Bank Building, Washington, is secretary of the association. Richard H. Brown is chairman of the board of directors, J. Carson Adkerson, is president and John H. Cole, first vice-president.

Quiet Prevails in European Markets

Hot Weather and Holiday Season Exert Retarding Influence—Swedish Ore More Active—May Establish Thin-Sheet Cartel

(*By Cable*)

LONDON, ENGLAND, July 22.

INCREASING costs of iron ore and fuel are stiffening Cleveland pig iron prices and consumers are hastening to place their last quarter requirements. Deliveries earlier than September are obtainable only in small lots from merchants at more than market prices. Pig iron activity is consequently greater than is usual in the summer months.

Hematite iron is moving freely and prices are tending upward. Steel business is quiet as Scottish plants have closed for the holidays and English plants are preparing for vacations. Most Northeast Coast works are well occupied and plate mills are in a better position.

Japan is purchasing moderately, but Chinese demand has been hindered by the political situation in Manchuria.

Tin plate inquiry is good, but business is still restricted and mills are closing down at intervals under the restriction of output plan. Production is further curtailed by the hot weather. It is expected that the July production quota will be further reduced, which will entail more mills stopping. Consequently prices are considered more likely to be advanced in the near future.

Galvanized sheets are quiet but Indian reports are more optimistic and buying is expected to develop before long. Japan is buying a few small tonnages of light-gage black sheets.

Redpath, Brown & Co., Ltd., Edinburgh, have secured a £250,000 ($1,212,500) contract for the steelwork in the new Ford Motor Co. plant at Dagenham.

Continental markets are weak as a result of the general absence of large orders and increasing activity of mills seeking to replace contracts which are expiring. Prices of semi-finished material and merchant bars are especially easy, but plates and shapes are steady.

Collapse of the International Hoop Cartel has caused disorganization of prices, which are now about £6 to £6 2s. 6d. per ton, base (1.30c. to 1.32c. per lb.).

Swedish Company Mining Chrome Ore in Turkey

HAMBURG, GERMANY, July 3.—Seeking a source of chrome ore supply other than from the South Rhodesian Chrome Ore Mining Co., Swedish steel companies, including the Forsbacka Jernverks A. B. at Forsbacka, Avesta Jernverks A. B. at Avesta and the Fagersta Bruks A. B. at Fagersta, have formed a company with headquarters at Stockholm, Sweden, which has obtained a concession from the Turkish Government for mining chrome ore. The deposits, which are near Angora, are reported to be rich and a small tonnage has been shipped to Sweden. It is believed in some quarters that by 1931 the new mines will be able to supply an important tonnage to European consumers and some ore may be available for shipment to the United States.

May Form Continental Thin-Sheet Cartel

HAMBURG, GERMANY, July 8.—Establishment of the French Black Sheet Comptoir has not yet affected the market, but French prices are higher than formerly, and there has been a general slackening of demand. The German sheet market showed no upward tendency of prices after formation of the French comptoir or the German Feinblechkontor. The German association controls only about 50 per cent of the German sheet production.

Since formation of the Feinblechkontor, it is reported that Continental mills rolling thin-gage sheets, No. 28 and 30 gage, such as are bought by the Japanese market, are considering establishment of a separate syndicate and have approached British and American sellers with a view to formation of an international cartel or loose agreement covering these thin gages. Most of these mills in Germany are in the present Feinblech-

British and Continental European Export prices per gross ton, f.o.b. United Kingdom Ports, Hamburg and Antwerp, with the £ at $4.85

British Prices, f.o.b. United Kingdom Ports

Cleveland No. 3 foundry	£3	12½s.	to	£3	13½s.	$17.58	to	$17.82
East Coast Hematite	3	15	to	3	15½	18.18	to	18.30
Ferromanganese, export	14	0				67.90		
Billets, open hearth	6	7½	to	6	10	30.92	to	31.52
Sheet bars, open hearth	6	5	to	6	10	30.31	to	31.52
Black sheets, Japanese specifications	13	0	to	13	5	63.05	to	64.26
Tin plate, per base box	0	18¼	to	0	18½	4.40	to	4.48
Rails, 60-lb. and heavier	7	15	to	8	15	37.59	to	42.43
						Cents per Lb.		
Steel bars, open hearth	7	15	to	8	10	1.67	to	1.84
Beams, open hearth	7	2½	to	7	12½	1.55	to	1.65
Channels, open hearth	7	7½	to	7	17½	1.60	to	1.71
Angles, open hearth	8	2½	to	8	12½	1.76	to	1.86
Ship plates, open hearth	7	12½	to	8	2½	1.66	to	1.76
Black sheets, No. 24 gage	10	5	to	10	10	2.21	to	2.27
Galvanized sheets, No. 24 gage	13	7½				2.90		

Continental Prices f.o.b. Antwerp or Hamburg

Foundry iron, 2.50 to 3.00 per cent sil., 0.50 to 0.90 per cent phos.	£3	10s.	to	£3	14½s.	$16.97	to	$18.06
Foundry iron, 2.50 to 3.00 per cent sil., 1.00 per cent and more phos.	3	12				17.45		

Billets, Thomas	5	1	to	5	5	24.49	to	25.46
Sheet bars, Thomas	5	4	to	5	5	25.22	to	25.46
Wire rods low C., No. 5 B.W.G.	6	5	to	6	6¼	30.31	to	30.61
Black sheets, No. 31 gage, Japanese	12	10				60.62		
Rails, 60 lb. and heavier	6	10*				31.52		
Rails, light	6	1½				29.46		
						Cents per Lb.		
Steel bars, merchant	5	14	to	5	15	1.26	to	1.27
Steel bars, deformed	5	13½	to	5	14	1.25	to	1.26
Beams, Thomas, British standard	5	4	to	5	8	1.12	to	1.15
Channels, Thomas, American sections	6	0				1.32		
Angles, Thomas, 4-in. and larger, over ¾-in. thick	5	6				1.14		
Angles, Thomas, 3-in.	5	16				1.28		
Ship plates, open-hearth inspected	7	10				1.62		
Hoop and strip steel, over 6-in. base	6	0	to	6	2½	1.32	to	1.33
Wire, plain, No. 8 gage	7	10				1.62		
Wire, galvanized, No. 8 gage	9	10	to	9	12½	2.06	to	2.12
Wire, barbed, 4-pt. No. 12 B.W.G.	11	18				2.57		
Wire nails, base	8	0½				$1.74	per	keg
Wire nails, assortments, 1 to 6-in., keg	10	6½				2.23		

*Open-hearth steel, 10s. ($2.42) per ton extra.

kontor, but that association states that it has no intention at present of participating in an international sheet agreement.

Columeta in Luxemburg and the Paris sales offices of the Luxemburg mills have advanced their prices on black sheets and are now quoting on a level with British mills, which are leading at present in sheet exports to Japan. The present price is £12 10s. ($60.62) per ton, f.o.b. Antwerp, with the possibility of a concession of 1s. 6d. (36c.) per ton on large orders. This is also the price quoted in Germany, so that, although there is no cartel or agreement in force at present, prices are uniform, an unusual situation for any commodity in the Continental steel market.

Sweden Increasing Iron Ore Exports

STOCKHOLM, SWEDEN, July 6.—Producers of iron ore, including the Grangesberg Corporation, have informed Continental consumers that exports of iron ore in the first half of this year totaled 4,153,000 tons, and it is planned to export 9,000,000 tons in 1930 and about 9,500,000 tons in 1931. The schedule of next year's exports of iron ore includes estimated shipments of 6,000,000 tons by the Kiruna-Narvik mines, 200,000 tons by the Kiruna-Luleo mines, 2,250,000 tons by the Malmberget-Luleo mines and 500,000 tons by others. Of the total shipments of ore in the first half of this year about 90 per cent went to German consumers.

Germany Replacing Copper Wire with Aluminum

HAMBURG, GERMANY, July 8.—Aluminum wire is now being used extensively by the German telephone and telegraph department and in other Continental countries for overland lines. In Great Britain, especially, there is an increasing use of aluminum wire for transmission purposes. Copper products manufacturers in Germany claim that they have lost more customers in the past year than at any previous time, and that their business has declined to such a degree that their requirements are being covered by the present small orders and it will be unnecessary to buy more heavily in the future unless consumers using other metals return to the use of copper.

German Non-Ferrous Exports Up

HAMBURG, GERMANY, July 8.—German exports of semi-finished nonferrous products for the first five months of this year were 39,108 tons, compared with 31,983 tons in the same period of 1928. This is the largest total of exports that has been reached. Brass and copper semi-finished products constituted 89.7 per cent of the total.

German Scrap Quiet After Heavy Buying Movement

HAMBURG, GERMANY, July 8.—Iron and steel scrap is quieter following the recent heavy demand and upward movement of prices, which began in May. The Vereinigte Stahlwerk A. G., Düsseldorf, has succeeded in covering its heavy melting steel requirements for the rest of this year on contracts at about 67 m. ($15.96) per metric ton, delivered to the works, but other consumers paid higher prices. Buying has declined since the middle of June and prices are easier, but stocks of scrap in Germany are small and exports have been reduced to a few small tonnages.

Joint Sales Company Formed by German Motor Builders

HAMBURG, GERMANY, July 8.—The Junkerswerke, Dessau, and the Berlin-Tegel locomotive and motor works have formed a sales company under the name Vereinigte Deutsche Industriewerke Junkers-Borsig-Hall, with headquarters in Berlin. The company will establish sales agencies in the Near East, the first offices opened probably being in Egypt, Palestine, the Sudan and Cyprus. It will handle the sales of complete pumping stations and Diesel engines. Eventually the company will also operate agencies in the Far Eastern markets.

Japan Inquires for Rails—Buys Welsh Tin Plate

NEW YORK, July 22.—Export to the Far East is still rather small. The Nippon Oil Co. in Japan recently closed on about 25,000 base boxes of tin plate with Welsh mills, the second successive order from this company to go to British makers. Tokio municipality is opening bids on about 3000 tons of grooved rails. Japanese consumers of billets and sheet bars have not inquired for some months, following an active period of buying last fall and early this spring. Chinese merchants are inquiring for wire shorts, tin plate waste waste, bar crop ends and plate cuttings, but in most instances are unwilling to pay the prices quoted by American sellers of such material.

Russian Machinery Buying Has Increased

The Soviet Union purchased industrial machinery valued at $18,000,000 from American manufacturers in the first nine months of the current Soviet fiscal year, beginning Oct. 1, 1928, states the Amtorg Trading Co. Adding the value of tractors ordered recently, the total for slightly more than nine months is about $40,000,000. Purchases for the entire fiscal year 1927-1928 amounted to $33,000,000. In addition to transactions for immediate delivery, the Amtorg company has contracted for industrial and agricultural machinery aggregating $75,000,000 to be delivered in the next few years.

Not Many Locomotives Need Repairs

Fewer locomotives were in need of repair on the Class I railroads of the United States on July 1 than at any time since the railroads began the compilation of these reports in 1920. They totaled 7453, or 13 per cent of the number on line, according to the American Railway Association. This was a reduction of 350 locomotives or 4.5 per cent compared with the best previous record, established on June 1, 1929, at which time there were 7803 locomotives, or 13.6 per cent, awaiting repairs.

Class I railroads on July 8 had 204,308 surplus freight cars in good repair and immediately available for service. This was a reduction of 13,349 cars compared with June 30, at which time there were 217,657 cars.

Engineers to Discuss Industrial Trend

"Trends in Industry" will be the major theme of the sixteenth national convention of the Society of Industrial Engineers, to be held at the Hotel Statler, Cleveland, Oct. 23, 24 and 25.

Sessions will be held each morning and evening and plant inspection trips are planned for each afternoon. George C. Dent, 205 West Wacker Drive, Chicago, is executive secretary of the society.

Canadian Steel Output for Half Year Shows Gain

Canadian production of steel ingots and direct steel castings during June dropped to 119,505 gross tons from 126,372 tons in the previous month, but was slightly higher than the 116,530 tons reported for June last year. Compared with figures for May, the output in June showed a decline in steel ingots to 113,341 tons from 120,015 tons in May, while the output of steel castings showed little change at 6164 tons from 6357 tons in the previous month.

For the six months ended with June 30 the production of steel ingots and direct steel castings amounted to 738,842 gross tons, or an increase of 14 per cent over the 648,338 tons made during the corresponding six months of last year, and was 52 per cent greater than the 487,310 tons produced in the first half of 1927. This year's output to the end of June included 703,600 tons of ingots and 35,242 tons of direct steel castings.

Service Steel Co., Detroit, has opened a warehouse in Buffalo, where a stock of seamless steel tubing will be carried.

Steel Companies' Profits Rise Sharply

Youngstown Sheet & Tube Co.'s Gain About 38 Per Cent in Second Quarter Over First—Republic Iron & Steel Co. Also Makes Substantial Gain

STEEL companies' profits rose sharply in the second quarter of the year. Only a few companies have so far announced their figures for the quarter and first half, but the profits statements that have been published point unmistakably to the fact that the first six months of 1929 have broken all records for earnings in peace times.

The Youngstown Sheet & Tube Co. reported a net income for the June quarter of $6,107,057, allowing for interest, depreciation, Federal taxes, etc., equivalent after dividend requirements on the preferred stock to $5.90 a share on the 1,000,000 shares of the common stock. This compares with $4,430,316, or $4.22 a share on common shares in the first quarter and $2,490,891 or $2.24 a share of common in the June quarter of 1928.

Net income for six months ended June 30, this year, totaled $10,537,373, after above charges, equal to $10.12 a share on common stock, comparing with $4,154,407 or $3.65 a share in the first half of 1928.

The gain in Youngstown's profits in the second quarter over those of the first quarter was $1,676,741, or almost 38 per cent, a surprising record in view of the fact that a considerable portion of the company's capacity is in pipe, which has not been in as great demand during the past quarter as some of the other rolled products.

Donner Had Good First Half

The Donner Steel Co. made only a slight gain in the second quarter over the first, but its net income for the entire first half was more than three times that of the corresponding period last year. Donner's second quarter net income was $644,320 against $634,625 in the first quarter. After charges for depreciation, interest, Federal taxes, etc., this amount, after allowance for dividends on prior preference stock, was equal to $1.29 a share on the common stock, compared with $1.27 in the first quarter.

Net income for the six months of this year totaled $1,278,945 after above charges, equal to $2.56 on the common, against $391,218, or 61c. a share, on the common in the first half of 1928.

Republic's Gain Substantial

The Republic Iron & Steel Co., with a net gain of $386,182 in its second quarter profits over those of the first quarter, or about 13 per cent, did not do quite so well as its next-door neighbor, Youngstown Sheet & Tube Co. Republic's net profit for the second quarter was $3,263,309, after charges for interest, depreciation, Federal taxes, etc., equivalent after dividends on the preferred stock to $3.44 a share on the 819,865 shares of common stock outstanding.

In the first quarter Republic's net profits were $2,877,127, or $3.03 a share on 804,568 shares of common. In the June quarter of 1928 Republic made $1,053,855, or $1.03 a share on the 596,030 shares of common then outstanding. Republic profits for the first half of the year totaled $6,140,435, equal to $6.42 a share on 819,865 shares against $1,541,187 or $1.11 a share on the 596,030 shares in the first half of 1928. Profits for the first half of 1928 included earnings of the Trumbull Steel Co. only for the June quarter.

Reflects Good Situation in Sheets

The Michigan Steel Co.'s profits illustrate the good situation during the first half in the manufacture of sheet steel, which is this company's only product. The net profit for the first half is estimated at $1,185,000 after the usual charges, equal to $5.38 a share on 220,000 shares of common stock. This record is better than the profits of any previous full year. Net profits in 1928 were $1,049,902, or $4.77 a share.

Net Income of Steel and Pig Iron Companies in First Half Much Higher Than in First Half of Last Year

	1929 First Half	1928 First Half	Per Cent of Gain
Youngstown Sheet & Tube Co.	$10,537,373	$4,154,407	153.6
Republic Iron & Steel Co.	6,140,435	1,541,187	298.4
Newton Steel Co.	1,519,889	1,356,933*	...*
Michigan Steel Co.	1,185,000 (estimated)	1,049,902*	...*
Colorado Fuel & Iron Co.	1,384,164†	720,529†	92.1
Donner Steel Co.	1,278,945	391,218	226.9
Acme Steel Co.	1,730,671	1,014,590	70.6
Gulf States Steel Co.	759,885	541,802	40.2
McKeesport Tin Plate Co.	1,084,562	852,974	27.2
M. A. Hanna Co.	1,733,454	446,659	288.1
Columbia Steel Corporation	1,066,737	679,761	56.9
Otis Steel Co.	2,798,398	1,743,066	60.6
Central Alloy	3,324,277	2,240,359	48.4
Superior Steel Corporation	181,377	—32,357	...

*Newton Steel Co. and Michigan Steel Co. did not report earnings for the first half of 1928, so the figures for all of 1928 are used. Both companies made materially more in the first half of this year than in all of last year.

†Colorado Fuel & Iron Co.'s figures are before allowance for Federal taxes.

The Colorado Fuel & Iron Co. did not do as well in the second quarter as in the first quarter. In the first quarter the company earned $918,677 and in the second quarter $465,487.

Ore and Pig Iron More Profitable

Improved conditions this year in the ore and pig iron trades are reflected in the report of the M. A. Hanna Co., which in the June quarter earned $1,351,714, after charges for depreciation, interest, Federal taxes, etc. This compares with $381,739 in the first quarter and $558,425 in the June quarter of last year. The Hanna company's second quarter profits were equal to $12.07 a share on 111,994 shares of 7 per cent preferred stock, on which there are accumulated back dividends. For the first half Hanna's profits were $1,733,454 after above charges, equal to $15.47 a share on preferred.

Otis Steel Earnings

Net earnings of The Otis Steel Co. after all charges, including estimated Federal taxes, were $1,630,218 for the second quarter of 1929, compared with $907,536 for the second quarter of 1928, an increase of 79 per cent.

For the first six months of 1929, after similar charges, the company reported $2,798,398, compared with $1,743,066 for the first six months of 1928, an increase of 60 per cent. Earnings for the first half of 1929 were equivalent to $2.94 a share on the common stock, compared with $1.64 for the first six months of 1928.

President E. J. Kulas reports that the company's output continues practically at capacity, with large bookings indicating considerably less than the usual seasonal slackening.

Central Alloy Steel Corporation

Earnings of the Central Alloy Steel Corporation for the second quarter of 1929 were $1,892,934 after all charges including depreciation and estimated federal taxes. This was equivalent to $1.32 a share on the 1,296,371 shares of common stock outstanding. In the second quarter of 1928, the company reported $1,265,230, after similar charges, or 84 cents a share on the common stock.

For the first half, earnings for the company were $3,324,277, equal to $2.29 a share on common compared with $2,240,359, or $1.46 a share, in the first half of 1928.

The Consolidated Steel Corporation, a combination of the Baker Iron Works, Union Iron Works and Llewellyn Iron Works, reports for six months ended June 30, 1929, net profit

of $366,468 after charges and Federal taxes, equivalent to 85 cents a share on 240,000 no-par shares of common stock after dividends on $1.75 no-par preferred stock. The consolidation of the three Los Angeles companies was effected December, 1928.

Net profit of the Superior Steel Corporation for six months ended June 30 was $181,377, after taxes and charges, against net loss of $32,357 the first half of 1928. Net profit for the June quarter was $73,025, after taxes and charges, against $30,760 in June quarter of the previous year, also after taxes and charges.

Fabricated Structural Steel

One-Half of Past Week's Awards Were for Industrial Projects and Railroad Work

ALMOST one-half of the structural steel awards of the past week totaling 38,000 tons, were for industrial projects and railroad work and a substantial portion of fresh inquiries is for similar classes of jobs. New work which appeared for bids was far below that of the previous week, amounting to less than 34,000 tons.

Outstanding among lettings were 4200 tons for a telephone building in New York, 4000 tons for transmission line towers at Memphis, Tenn., and 3000 tons each for an office building at Boston and for a structure in Baltimore, Md., for the Western Electric Co. The largest inquiry was for 13,200 tons for a subway section in New York, 3800 tons for an office building in Newark, N. J., and 3000 tons for a plant for the Pratt & Whitney Aircraft Corporation at East Hartford, Conn. Awards follow:

MONTREAL, 1500 tons for Legault bridge, to Dominion Bridge Co.

MILLINOCKET, ME., 630 tons, paper mill, to Megquier & Jones Co.

BOSTON, 3000 tons, office building, Franklin and Federal Streets, to McClintic-Marshall Co.

CAMBRIDGE, MASS., 275 tons, Radcliffe College building, to New England Structural Co.

JAMAICA-WARREN, VT., 190 tons, two State bridges, to unnamed fabricator.

MEDFORD, MASS., 160 tons, school, to New England Structural Co.

BROOKLINE, MASS., 120 tons, school, to New England Structural Co.

SOUTH BRAINTREE, MASS., 100 tons, gasoline still supports, to New England Structural Co.

BOSTON & MAINE RAILROAD, 100 tons, west wing of North Station in Boston, to New England Structural Co.

BOSTON & MAINE RAILROAD, 115 tons, bridge at Andover, Mass., to Boston Bridge Works.

NEW YORK, 600 tons, theater on West Fifty-first Street, to Harris Structural Steel Co.

NEW YORK, 4200 tons, building on West Eighteenth Street for New York Telephone Co., to McClintic-Marshall Co.

NEW YORK, 300 tons, Seaboard Bank Building on West Thirty-fourth Street, to Levering & Garrigues Co.

EDWARDS, N. Y., 500 tons, building for St. Joseph Lead Co., to Kellogg Structural Steel Co.

BUCKHILL FALLS, PA., 450 tons, addition to Inn, to McClintic-Marshall Co.

WILKES-BARRE, PA., 280 tons, Kirby Memorial Hospital, to Bethlehem Fabricators.

PENNSYLVANIA RAILROAD, 700 tons, bridges, to Bethlehem Steel Co. and American Bridge Co.

PHILADELPHIA, 360 tons, repairs to Spring Garden Street bridge for Department of Public Works, to Shoemaker Bridge Co.

NORFOLK & WESTERN RAILROAD, 1200 tons, bridges, to Virginia Bridge & Iron Co.

NORFOLK & WESTERN RAILROAD, 875 tons, bridges, to Mount Vernon Bridge Co.

BALTIMORE, 3000 tons, insulated wire building for Western Electric Co., to unnamed fabricator.

BALTIMORE & OHIO RAILROAD, 350 tons, signal bridges, to McClintic-Marshall Co.

BALTIMORE & OHIO RAILROAD, 400 tons, bridges in Ohio, to American Bridge Co.

LOUISVILLE & NASHVILLE RAILROAD, 800 tons, addition to office building at Louisville, Ky., to Louisville Bridge & Iron Co.

MEMPHIS, TENN., 4000 tons, transmission line towers, to Nashville Bridge Co.

MONTGOMERY, ALA., 200 tons, State highway bridges, to Nashville Bridge Co.

GADSDEN, ALA., 325 tons, dirigible hangar for Goodyear Tire & Rubber Co., to Decatur Iron & Steel Co.

ABERDEEN, MISS., 125 tons, bridge over Tombigbee River, to Nashville Bridge Co.

PITTSBURGH, 1300 tons, recreation building for H. J. Heinz Co., to McClintic-Marshall Co.

ERIE, PA., 450 tons, grain elevator for Pennsylvania Railroad, to Pittsburgh Bridge & Iron Works.

MONACA, PA., 350 tons, Pittsburgh Tube Co., to Pittsburgh Bridge & Iron Works.

MICHIGAN CENTRAL RAILROAD, 300 tons, bridges, to American Bridge Co.

MIDDLETOWN, OHIO, 300 tons, Middletown Bank & Deposit Co. building, to Dayton Structural Steel Co.

CLEVELAND, 1000 tons, City Hospital, to unnamed fabricator.

STATE OF INDIANA, 700 tons, miscellaneous work, to Indiana Bridge Co.

WAUKESHA, WIS., 250 tons, additions for Clancy Malleable Iron Corporation, to Worden-Allen Co.

KENOSHA, WIS., 100 tons, shipping platform for Nash Motors Co., to Worden-Allen Co.

STEVENS POINT, WIS., 132 tons, insurance building, to Duffin Iron Co., Chicago.

CHICAGO, 850 tons, West Town Bank building, to Midland Structural Steel Co.

CHICAGO, 190 tons, Goodman Mfg. Co., to Duffin Iron Co.

CHICAGO, 250 tons, manufacturing building, to Duffin Iron Co.

CHICAGO, 1100 tons, Burnham Avenue bridge, to an unnamed bidder.

UNION PACIFIC, 200 tons, foot-bridge, to McClintic-Marshall Co.

CHICAGO & ALTON, 240 tons, bridge work, to American Bridge Co.

ST. LOUIS, 450 tons, Woolworth Building, to American Bridge Co.

GALENA, KAN., 600 tons, building for Eagle-Picher Co., to Illinois Steel Bridge Co., Jacksonville, Ill.

SAN ANTONIO, TEX., 1800 tons, Nix Building, to Orange Car & Steel Co.

LOS ANGELES, 250 tons, bridges for Pacific Electric Co., to Virginia Bridge & Iron Co.

LOS ANGELES, 150 tons, packing plant, 803 Macy Street, to Consolidated Steel Corporation.

LOS ANGELES, 150 tons, hangar for Goodyear Zeppelin Co., to McClintic-Marshall Co.

SAN FRANCISCO, 200 tons, apartment building, Haight and Buchanan Streets, to Golden Gate Iron Works.

SAN FRANCISCO, 140 tons, apartment building, Vallejo and Laguna Streets, to Western Iron Works.

SAN FRANCISCO, 100 tons, alteration to Orpheum Theater, to Western Iron Works.

SAN FRANCISCO, 250 tons plates, seven tanks for Southern Pacific Co., to Chicago Bridge & Iron Works.

BERKELEY, CAL., 125 tons, factory for California Corrugated Culvert Co., to Pacific Coast Engineering Co.

PORTLAND, ORE., 250 tons, sorting racks for Hines Lumber Co., to Poole & McGonigle.

VALE, ORE., 125 tons plates, siphon, to Western Pipe & Steel Co.

KLAMATH FALLS, ORE., 150 tons plates, burner for Weyerhaeuser Timber Co., to Seattle Boiler Works.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

MIDDLETON, MASS., 100 tons, hospital addition.

EAST HARTFORD, CONN., 3000 tons, building for Pratt & Whitney Aircraft Corporation.

NEW YORK CENTRAL RAILROAD, 2400 tons, work at Harmon, N. Y.

STATE OF NEW YORK, 1600 tons, highway bridge at Batchelorville, N. Y.; Pittsburgh-Des Moines Steel Co., low bidder.

NEW YORK, 13,200 tons, section 5, route 108 of subway in Queens.

NEWARK, N. J., 3800 tons, building for American Insurance Co.

ATLANTIC CITY, N. J., 175 tons, addition and alterations to Hotel Flanders, 127 St. James Place.

PENNSYLVANIA RAILROAD, 1000 tons, six bridges.

QUEBEC, Department of Public Works, 2000 tons, bridge between Lachine and Coughnawaga.

QUEBEC, Department of Roads, 200 tons, bridge over St. Jacques River.

HAMILTON, ONT., 1250 tons, four school buildings.

TORONTO, 150 tons, bridge over ship channel at Cherry Street for Harbor Commission.

BUFFALO, 400 tons, post office for New York Central terminal.

BUFFALO, 1000 tons, New York State office building.

CLEVELAND, 450 tons, Christian Science Church.

NILES, OHIO, 200 tons, building for Niles Trust Co.

CHICAGO, 1800 tons, Rosenwald Industrial Museum: R. C. Wieboldt Co., general contractor.

ST. LOUIS, 350 tons, service station for Mack Truck Co.

KANSAS CITY, MO., tonnage not stated, university building.

DALLAS, TEX., 1500 tons, Southwestern Bell Telephone Co. building.

BOISE, IDAHO, 257 tons, reclamation work; bids opened.

Machinery Markets and News of the Works

Tool Buying Well Sustained

Sales Have Been Above Normal and Inquiries Are of Substantial Volume

MACHINE tool buying has been sustained at a rate higher than normal for this time of the year. Sales have run considerably ahead of those in the corresponding period of last year, though not up to the June volume.

The absence of transactions on a large scale has been offset by the steady flow of orders for one or two tools each. Almost all consuming industries have contributed to recent business, which has been well distributed throughout the country. The New York district has been especially active in this respect.

Sales of brakes and presses for manufacture of sheet metal products have attracted attention because of the liberal volume.

Inquiries are sufficiently impressive to indicate that there will be no marked diminution in business during the remainder of the summer. Meanwhile, machine tool plants are operating at capacity to reduce unfilled orders and secure easier deliveries.

United Dry Docks, Inc., New York, is in the market for equipment for a tank shop. A French commission is expected to buy automatic lathes for boring cylinders of airplane motors.

An advance of from 5 to 10 per cent in the prices of some planer builders is noted. One line of engine lathes and a line of milling machines have been increased about 10 per cent.

New York

NEW YORK, July 23.—Although machine tool buying has slowed up a bit, as compared with the peak activity of the past few months, it is still at an unusually high rate for July. No large buying is reported, but there is a steady flow of orders for one or two machines, and local offices are quoting on a good deal of prospective business. This has been an exceptional season for the sale of brakes for sheet metal work. United Dry Docks, Inc., New York, is in the market for complete equipment for a tank shop. Some manufacturers of planers have announced advances in prices ranging from 5 to 10 per cent.

Plans are under way by Third Avenue Railway Co., 2396 Third Avenue, New York, for a two-story addition to mechanical and motor bus repair shop, to cost about $40,000 with equipment. E. H. Faile & Co., 441 Lexington Avenue, are architects.

Mutual Sunset Lamp Mfg. Co., 21 East Houston Street, New York, has leased space in Trade Facilities Building, Brooklyn, totaling 60,000 sq. ft. floor area, and will establish new plant. It is understood that New York factory will be removed to new site.

Brooklyn Borough Gas Co., Mermaid Avenue and West Seventeenth Street, Brooklyn, is said to be planning call for bids on general contract early in August for new shop, automobile service and garage building, 157 x 200 ft., for company cars, to cost more than $200,000 with equipment. Block & Hess, 18 East Forty-first Street, New York, are architects.

Continental Can Co., 1 Pershing Square, New York, is planning an expenditure of about $2,000,000 during next six months for extensions and improvements in plants, including additions to can-manufacturing plant at San Jose., Cal., and enlargement of works at Seattle.

Lehigh Valley Railroad Co., 143 Liberty Street, New York, is planning electrification of lines between Mauch Chunk and Wilkes-Barre, Pa., to cost about $8,500,000 with equipment.

Delaware, Lackawanna & Western Railroad Co., 90 West Street, New York, has awarded general contract to Turner Construction Co., Graybar Building, for new coal pocket and distributing plant, 40 x 308 ft., at South Brooklyn, with conveying, loading and other mechanical equipment, to cost more than $100,000.

Rubel Coal & Ice Corporation, 937 Fulton Street, Brooklyn, is planning expansion in ice-manufacturing division, and will build a group of new plants in Brooklyn, to cost over $5,000,000 with machinery. Company has disposed of coal business and will concentrate activities in future largely in ice production.

United Aircraft & Transport Corporation, operating Chance-Vought Corporation, Long Island City, manufacturer of aircraft equipment, and other interests, has purchased Sikorsky Aviation Corporation, specializing in production of military and other aircraft, with plant at College Point, L. I., and new factory nearing completion at Bridgeport, Conn., and will consolidate. First noted plant will be continued at present location and later will be consolidated with works at Bridgeport. A. C. Dickinson is president.

Atlantic Basin Iron Works, Inc., Van Brunt, Summit and Bowne Streets, Brooklyn, manufacturer of marine engines, valves, forgings, etc., plans rebuilding part of plant destroyed by fire July 17, with loss more than $75,000, including equipment.

Western Electric Co., 195 Broadway, New York, with plant at Kearny, N. J., manufacturer of radio equipment, telephone apparatus, etc., has leased one and three-story plant, 175 x 210 ft., totaling about 45,000 sq. ft. floor space at 132-52 Tichenor Street, Newark, for a tool-making division.

Essex County Vocational Schools, 960 Broad Street, Newark, N. J., will take bids at once for three-story boys' vocational school at Bloomfield, N. J., to cost over $400,000 with equipment. Guilbert & Betelle, 24 Branford Place, Newark, are architects.

V. J. Burnelli, Keyport, N. J., has leased part of local plant of Aeromarine-Klemm Corporation manufacturer of aircraft, for the production of special transport airplanes, including parts manufacture and assembling.

Flintkote Co., East Rutherford, N. J., manufacturer of roofing products, is said to have plans for a two-story addition, to cost more than $40,000 with equipment. Headquarters are in Park Square Building, Boston.

C. M. Gray Mfg. Co., 358 Central Avenue, East Orange, N. J., manufacturer of die-castings, is considering plans for a three-story addition, to cost about $70,000 with equipment.

Board of Education, Cranford, N. J., is considering installation of manual training equipment in new two-story senior high school to cost $700,000, for which plans are being drawn by H. B. Brady, Inc., 333 North Broad Street, Elizabeth, N. J., architect.

New Standard Aircraft Corporation, 230 East Sixteenth Street, Paterson, N. J., is disposing of an additional stock issue, part of funds to be used for expansion. Company is arranging for early production of a new training plane on maximum basis, including parts manufacture and assembling.

United Dry Docks, Inc., 11 Broadway, New York, recently organized to merge several shipbuilding and dry dock plants in New York district, is contemplating erection of new tank shop to cover about 2¼ acres. Company is in market for plate bending rolls, angle bending rolls, a flanging press, electric welding machines and overhead electric cranes. Harry Lindemann, of tank and fabricated steel department, Staten Island, is in charge of prospective work.

Plastic Die & Molding Co., 249 Verona Avenue, Newark, N. J., has been organ-

ized to make stamping and forming dies and permanent molds by a new process. A. B. Strickler is secretary.

Great Neck Manufacturers, Inc., Great Neck, N. Y., has begun manufacture of tungsten hack saw blades under brand name of Monarch. Sales offices are at 162 Chambers Street, New York.

Philadelphia

PHILADELPHIA, July 22.—Bids have been asked on general contract by Schuch Machine Co., 235 New Street, Philadelphia, for one-story plant to cost more than $30,000 with equipment. Charles E. Olschager, 1615 Walnut Street, is architect.

Kensington Shipyard & Drydock Corporation, Philadelphia, recently organized by Francis J. McDonald, president of Baltimore & Philadelphia Steamboat Co., Pier 3, South Delaware Avenue, and associates, has acquired shipbuilding plants and repair yards of Philadelphia Ship Repair Co., Kensington Shipyard & Drydock Co., Camden Shipbuilding Corporation, Camden, and Noecker & Ake Shipbuilding Co., Camden. New owner will consolidate and operate different properties, and plans expansion. Another plant, also, is projected on waterfront property at Philadelphia, to consist of two graving docks, each with capacity for vessels up to 16,000 tons, 700 ft. and longer, with machine and other shops for repair work, to cost more than $1,000,000.

Bendix Brake Service Co., 3914 North Broad Street, Philadelphia, automobile brakes and equipment, a subsidiary of Bendix Brake Co., South Bend, Ind., will take bids on revised plans for two-story and basement factory branch, service and repair plant, 75 x 175 ft., to cost $150,000 with equipment. H. G. Christman Co., 306 South Notre Dame Avenue, South Bend, is architect.

Fayette R. Plumb Co., Inc., 4837 James Street, Philadelphia, manufacturer of edged tools, plans rebuilding part of plant destroyed by fire July 13.

Board of Trustees, National Farm School, Doylestown, Pa., is taking bids until July 31 for a new farm machanics' building, to cost more than $30,000 with equipment. Edwin H. Silverman and Abraham Levy, Thirteenth and Chestnut Streets, Philadelphia, are architects.

American Radiator & Standard Sanitary Corporation, 40 West Fortieth Street, New York, has purchased plant and business of Thomas Maddock's Sons Co., Trenton, N. J., manufacturer of sanitary ware, and will operate as unit of organization. It is proposed to build addition to Maddock plant at Hutchinson's Mills, to cost more than $300,000. Present officials of Maddock company will continue with purchasing organization.

S. Arthur Fisher and Paul M. Cheesman, 844 High Street, Williamsport, Pa., have organized S. Arthur Fisher Body Co., capitalized at $60,000, to establish plant to manufacture automobile bodies, including truck bodies, a repair division will be provided. Raiser Weber, Howard, Pa., is also interested in new organization.

Authracite Combustion & Engineering Co., Inc., 5120 Wakefield Street, Philadelphia, has been incorporated to manufacture full line of blower equipment for use in homes, schools, churches and institutions. Company has provided manufacturing facilities. It will buy motors, blower castings, fans and temperature controls. F. E. Whitney is president.

Empire Steel Castings, Inc., Reading, Pa., has been incorporated to take over Empire Steel Casting Co. and will carry on business developed by its predecessor in electric alloy and carbon steel castings. Officers of new organization are: President, Frank Hodson; directors, Charles Shipman Payson, Wallace E. Belcher, D. W. Phillips; secretary-treasurer, J. E. Horton. Company has recently completed extensions to its foundry and further additions will be made in near future.

The Crane Market

INQUIRY for overhead traveling cranes is still rather limited and prospective buyers are slow to act on outstanding business. Some locomotive crane buying is reported, contractors beginning to close on some small capacity equipment. The Mallory Machinery Corporation, 522 Light Street, Baltimore, is inquiring for a used 5 to 10-ton, 80-ft. span, 3-motor, overhead crane. The Laclede Steel Co., St. Louis, is inquiring for three 5-ton, 105-ft. span, 3-motor, overhead cranes for its Alton, Ill., plant. The cranes for the new plant of the Great Lakes Steel Corporation at Ecorse, Mich., are reported to have been awarded to the Morgan Engineering Co.

Among recent purchases are:

New York Central Railroad, New York, two 25-ton locomotive cranes from Industrial-Brownhoist Corporation.

B. Levitt, Rome, N. Y., 7½-ton crawl-tread crane from Browning Crane Co.

James Stewart & Co., 230 Park Avenue, New York, two small crawl-tread cranes from Moore Speederane Co., 30 Church Street, New York.

Arthur A. Johnson Corporation, Long Island City, New York, small crawl-tread crane for subway work from Koehring Co., New York.

Gulf States Steel Co., Alabama City, Ala., one 40-ton, 73-ft. 3-in. span, blooming mill crane, one 40-ton, 92-ft. span and one 15-ton, 92-ft. span plate mill cranes and one 15-ton, 100-ft. span billet yard crane, from Alliance Machine Co.

South Atlantic

BALTIMORE, July 22.—Plans are under way by Flynn & Emrich Co., 301 North Holliday Street, Baltimore, manufacturer of mechanical stokers, parts, etc., for one-story foundry unit, to cost about $75,000 with equipment. W. S. Austin, Maryland Trust Building, is architect and engineer. James F. Turner is general manager.

Public Improvement Commission, City Hall, Baltimore, is said to be planning installation of manual training equipment in three-story junior high school to cost about $425,000, for which plans will be drawn by Taylor & Fisher, Union Trust Building, architects.

General Electric Co., Schenectady, N. Y., has awarded general contract to Flagler Co., Red Rock Building, Atlanta, Ga., for one-story and basement addition to motor and motor equipment factory branch and service works at Atlanta, 55 x 200 ft., to cost about $50,000 with equipment.

Southern Aviation Enterprises, Inc., Atlanta, Ga., recently formed by R. E. L. Cone, Palmer Building, and associates, is reported planning establishment of aircraft manufacturing plant near Birmingham, including parts and assembling departments for production of five-passenger type airplanes, initial unit to cost more than $65,000 with equipment.

Board of District Commissioners, District Building, Washington, has awarded general contract to English Construction Co., 1311 H. Street, N. W., for extensions and improvements in power plant at district training school at Laurel, Md., to cost about $35,000. Additional equipment will be installed.

Manufacturers' Light & Heat Co., Columbia Bank Building, Pittsburgh, has secured franchise for natural gas supply from properties in western Pennsylvania to Berlin, Grantsville, Meyerdale, Md., and vicinity, and plans installation of pipe lines and systems. It is also proposed to furnish service at Salisbury and adjoining communities.

Aluminum Co. of America, Inc., Oliver Building, Pittsburgh, is making ready to begin work on hydroelectric power project on Little Tennessee River, near Bryson City, N. C., where engineering office has been established. Project will include construction of three power dams, generating stations, switching plants and transmission lines, and is reported to cost more than $12,000,000 with machinery.

Kil Mfg. Co., incorporated for $50,000, has erected a plant at Kilmarnock, Va., to manufacture septic tanks, gutter and spouting, metal cornice, etc. Plant is 50 x 100 ft., two stories. A. W. Wagenseller is president.

New England

BOSTON, July 22.—Sales of machine tools were smaller than those of the previous week, although the majority of dealers did a fair business in single machines. New England sales for the first half of July ran ahead of those for the first half of June, owing primarily to activity in Connecticut. An encouraging feature is that additional inquiries are in hand with a sizable backlog of prospects to work on for the remainder of the year. It is believed that many metal-working plants will place requirements in August to obtain 1929 deliveries on certain types of tools. New England machine tool builders in general are operating at capacity on day shifts, with some maintaining night shifts in certain departments.

Maxium Fire Engine Co., Middleboro, Mass., has started work on a plant to cost $25,000.

John Alden Coal Co., Inc., Gloucester, Mass., will build coal pockets. Handling equipment is required.

Lever Brothers Co., 164 Broadway, Cambridge, Mass., has closed bids on a coal hopper. Conveyor equipment will be needed.

Stone & Webster, Inc., Boston, has preliminary plans for a power house for Everett, Mass., to be built by Edison Electric Illuminating Co. of Boston.

Maine Coal & Dock Co. will build a coaling plant at Bucksport, Me. A hoisting engine of 500 tons per hr. capacity and conveyor belts will be purchased.

City of Bloomfield, Conn., closes bids Aug. 1 for a high school to cost $140,000 with equipment. A manual training department is included.

City of Pittsfield, Mass., has plans for a high school to cost $2,200,000 with equipment. Manual training departments are contemplated.

Worcester Wire Works, 379 Main Street, Worcester, Mass., has started work on a one and two-story manufacturing unit, 20 x 68 ft.

United Aircraft & Transportation Co., Inc., Hartford, has started work on a plant to cost $2,000,000 with equipment.

Contract has been let by Scovill Mfg. Co., Waterbury, Conn., manufacturer of brass pipe, condenser tubing and kindred products, to Tracy Brothers Co., local, for four-story addition, 21 x 165 ft. to cost more than $65,000 with equipment. H. L. Thompson, Waterbury, is architect.

Plantsville Foundry, Inc., Plantsville, Conn., recently formed with capital of $50,000, will take over and operate former local foundry of Stewart-Walker Co., which recently filed petition in bankruptcy. Victor E. Walker, Meriden, Conn., formerly president of Stewart-Walker Co., will be identified with new organization.

Fairhaven Iron Foundry Co., Fairhaven, Mass., has awarded general contract to Macomber Street Co., 1925 Tenth Street, N. E., Canton, Ohio, for rebuilding one and two-story foundry, 50 x 100 ft., recently destroyed by fire, to cost about $45,000 with equipment.

Board of Education Providence, R. I., plans installation of manual training equipment in new three-story and basement junior high school to cost $1,200,000, for which bids have been asked on general contract. Commissioner of Public Buildings, City Hall, in charge.

Pratt & Whitney Aircraft Co., Hartford, Conn., manufacturer of Wasp aircraft engines, will break ground at once for new plant at East Hartford, with main unit one-story, 400 x 1000 ft.; two-story engineering building, and other one and two-story structures, entire group to cost about $2,000,000 with machinery. Albert Kahn, Inc., Marquette Building, Detroit, is architect and engineer.

Cadillac-LaSalle Co., 563 State Street, Springfield, Mass., representative for Cadillac and LaSalle automobiles, is having revised plans drawn for one and two-story and basement service, repair and sales building, to cost about $115,000 with equipment.

C. H. Dexter & Sons, Inc., Windsor Locks, Conn., manufacturer of paper goods, has purchased, for expansion, local mill of American Writing Paper Co., closed for several months. Some new equipment will be purchased.

Sinclair Refining Co., 205 East Forty-second Street, New York, will begin construction of oil storage and distributing plant at Hartford, to cost over $75,000 with equipment.

Buffalo

BUFFALO, July 22.—Plans have been filed by Trico Products Corporation, 817 Washington Street, Buffalo, manufacturer of automobile equipment and accessories, for one-story addition, to cost about $60,000 with equipment.

Charles Cory & Son, Inc., 183 Varick Street, New York, manufacturer of marine equipment, bells, etc., has acquired plant and business of Tucker Foundry Co., Medina, N. Y., manufacturer of cast iron pipe and fittings, and will take possession Aug. 1. New owner will operate plant as branch and plans expansion.

Buffalo General Electric Co., Electric Building, Buffalo, has plans for new steam-operated electric generating plant adjoining present Huntley station. Initial installation will provide for capacity of 80,000 kw., to be increased later. Project is reported to cost more than $2,000,000 with transmission lines.

Spriesch Tool & Mfg. Co., Buffalo, has been organized by James Spriesch, 179 Keystone Street, and associates, with capital of $40,000, to manufacture tools, dies and kindred products. New company will be affiliated with business heretofore operated under name of Joseph Spriesch, 183 South Elmwood Avenue, manufacturer of similar specialties, and it is understood will succeed to that organization. Thomas F. Morrissey, 135 Winspear Avenue, is also interested in new company.

Board of Education, Little Falls, N. Y., is considering installation of manual training equipment in new two-story junior high school to cost $300,000, for which bids will soon be asked on general contract. C. W. Clark, Savings Bank Building, Cortland, N. Y., is architect; A. R. Acheson, Eckel Building, Syracuse, N. Y., is mechanical engineer.

Airport Advisory Board of City Council, Buffalo, has plans for new marine airport, including two hangars, 125 x 150 ft., with repair facilities, to cost about $135,000 with equipment and other buildings. Nat E. Duffy, director of Genesee Street municipal airport, is in charge.

Fladd-Luig Co., Inc., 213 Central Avenue, Rochester, N. Y., is a jobber of plumbing and heating supplies and is not going into manufacture of machinery, as erroneously stated recently in these columns.

Syracuse Ornamental Co., 581 South Clinton Street, manufacturer of metal specialties, has awarded general contract to Dawson Brothers, Union Building, for extensions to cost about $30,000 with equipment.

Pittsburgh

PITTSBURGH, July 22.—Business in this district continues moderately active. A number of small orders have been placed the past week and new inquiries are appearing regularly. Railroad business, which has not been active since the recent placing of large lists by the Chesapeake & Ohio, has been revived slightly by small inquiries from the Baltimore & Ohio and the Pennsylvania. The Westinghouse Electric & Mfg. Co. has begun to make awards against its third quarter list, but buying by the United States Aluminum Co. for its plant extensions at New Kensington, Pa., is not expected for at least two weeks.

Deliveries have had little opportunity for improvement since the heavy buying movement of the spring and many dealers in this territory are still unable to quote on much business in which they would normally be interested. Local offices are busy preparing estimates on some of the larger prospects pending in the district and there is little prospect of any marked falling off in orders during the remainder of summer and early fall.

Standard Underground Cable Co., Seventeenth and Pike Streets, Pittsburgh, has plans for one-story addition to works at Perth Amboy, N. J., to cost about $200,000 with equipment. Part of Pittsburgh plant will be removed to that location when new unit is completed.

Standard Oil Co. of Pennsylvania, Ledger Building, Philadelphia, is planning an expansion at plant of Pennsylvania Lubricating Co., Lawrenceville, near Pittsburgh, including storage and distributing facilities, to cost more than $500,000 with equipment.

Aluminum Co. of America, Inc., Oliver Building, Pittsburgh, has acquired plant and business of Modern Foundry & Pattern Works, Inc., Oakland, Cal., manufacturer of aluminum castings, etc., and will operate as unit of organization. J. F. Russell and Peter Caird, president and vice-president of Modern Foundry company, will continue in present positions.

Romeson Mfg. Co., Titusville, Pa., recently organized by Gray I. Morriss, Beaver Falls, Pa., and associates, with capital of $150,000, to manufacture iron and steel products, has taken over Titusville plant of American Radiator Co., closed for about two years, and will remodel for early occupancy.

Continental Refining Co., Oil City, Pa., is planning to rebuild part of oil refinery destroyed by fire July 18.

City Council, Wheeling, W. Va., is planning establishment of municipal airport, including hangars, repair shops, oil storage and other buildings, to cost about $650,000. A bond issue will soon be voted.

Detroit

DETROIT, July 22.—Plans are under way by Hancock Iron Works, Pontiac, Mich., for one-story addition, to cost about $35,000 with equipment. R. O. Derrick, Pontiac Savings Bank Building, is architect.

Detroit Steel Products Co., 2250 East Grand Boulevard, Detroit, manufacturer of steel sash and kindred products, has plans for first unit of new plant, totaling 125,000 sq. ft. floor space, to cost more than $300,000 with equipment. Smith, Hinchman & Grylls, Marquette Building, are architects.

In connection with expansion program following acquisition of controlling interest in Lockheed Aircraft Corporation, Los Angeles, mentioned last week, Detroit Aircraft Corporation, Detroit, has leased part of former local plant of Studebaker Corporation, and will equip for manufacture of airplanes, including parts manufacture and assembling.

Old Dutch Refining Co., Muskegon, Mich., has broken ground for a new oil refinery near city, to cost more than $100,000 with machinery.

A. J. Bopp, General Motors Building, Detroit, formerly local district sales manager for Weirton Steel Co., is organizing Bopp Steel Corporation, to construct local plant to manufacture cold rolled steel products. Site has been purchased, and plans for initial unit will be drawn soon, to cost over $100,000 with equipment.

Board of Education, Flint, Mich., plans installation of manual training equipment in new two-story junior high school to cost $550,000, for which bids will soon be asked on general contract. Malcolmson & Higginbotham, 1219 Griswold Street, Detroit, are architects; McColl, Snyder & McLean, Penobscot Building, Detroit, are mechanical engineers.

Following recent purchase of controlling interest in American Cirrus Engines, Inc., 740 Washington Avenue, Belleville, N. J., manufacturer of aircraft engines, by Allied Motor Industries, Inc., Chicago, plans are being arranged for establishment of new plant in part of former works of Wills Motor Car Co., Marysville, Mich., lately taken over by Allied organization. Work will include establishment of two divisions, one for development of new aircraft engine for use by United States Navy, and other for expansion in assembling operations of present engines, now being conducted at Belleville plant, to cost more than $90,000.

Leonard Refrigerator Co., Clyde Park, S. W., Grand Rapids, Mich., has plans for an addition and improvements in present plant, to cost more than $40,000 with equipment.

Michigan Bell Telephone Co., 1365 Cass Avenue, Detroit, has plans for a six-story equipment storage and distributing plant, 340 x 505 ft., with mechanical and electrical repair and service divisions, to cost $1,400,000 with machinery. Smith, Hinchman & Grylls, Marquette Building, are architects.

Chicago

CHICAGO, July 22.—The machine tool market is becoming more active as the end of July approaches. Orders are scattered and usually for small numbers of tools, but many purchases are for large machines so that in point of value, many sellers' current business is more impressive than at the beginning of the month. The used tool market is less active, although the supply is still short of demand.

The Santa Fe has ordered a 600-ton hydraulic wheel press. Other than this purchases by the railroads are quiet. Farm implement manufacturers are showing less interest, although it is not unlikely that a sizable list will be issued early in August. Demand for presses, after having lagged for a time, during which deliveries improved, is brisk and comes from a wide diversity of users.

Prices have been advanced about 10 per cent on one line of lathes and a line of milling machines.

Blackhawk Foundry & Machine Co., Davenport, Iowa, is planning erection of a molding department, 122 x 164 ft.

Oil Products Appliance Co., Maywood, Ill., is erecting a second story to its plant which will provide 19,500 sq. ft. of additional floor space.

American Brake Shoe & Foundry Co., Maywood, Ill., is building an addition to its local machine shop.

Contract has been let by Chicago, Rock Island & Pacific Railroad Co., 139 West Van Buren Street, Chicago, to T. S. Leake Construction Co., 608 South Dearborn Street, for extensions and improvements in engine house and repair shops on Forty-seventh Street, to cost $350,000 with equipment. C. A. Morse is chief engineer.

Electrical Research Laboratories, Inc., 2500 Cottage Grove Avenue, Chicago, manufacturer of radio equipment and devices, has acquired plant of Cable Piano Co., for expansion.

J. E. Decker & Sons, 320 Fifteenth Street, N. W., Mason City, Iowa, have plans for new six-story addition to meat-packing plant and lard refinery, to cost $300,000 with equipment. H. Peter Henschien, 1637 Prairie Avenue, Chicago, is architect and engineer.

W. F. & John Barnes Co., Rockford, Ill., manufacturer of drills, drilling machinery and other machine tools, has plans for new two or three-story unit, to cost more than $70,000 with equipment. A. Eliel, Stewart Building, is architect.

Western Screw Mfg. Co., 4413 West Kinzie Street, Chicago, has awarded general contract to Anderson & Winblad, 6235 Michigan Avenue, for two-story plant, 170 x 322 ft., to cost $100,000 with equipment. A. Epstein, 2001 West Pershing Road, is architect and engineer.

Colorado Fuel & Iron Co., Pueblo, Colo., plans early rebuilding of portion of coal mining plant at Segunda, Colo., recently destroyed by fire, including tipples and equipment.

Onsrud Machine Co., 3910 Palmer Street, Chicago, has awarded general contract to Austin Co., for one-story addition, 80 x 100 ft., to cost about $35,000 with equipment.

Thomas Kelly & Brothers, 3424 West Lake Street, Chicago, manufacturers of plumbing equipment, brass goods, etc., have leased space in building at 4442 West Roosevelt Road, 75 x 125 ft., for expansion.

Midwest Carbide Corporation has recently been organized by National Lead Co. and Shawinigan Products Corporation, New York, a subsidiary of the Shawinigan Water & Power Co. of Canada, to carry on manufacture of calcium carbide at Keokuk, Iowa, heretofore conducted by United Lead Co., subsidiary of National Lead Co. Officers of new company will be supplied from staffs of owning interests, E. J. Cornish, president, National Lead Co., becoming president; L. F. Loutrel, vice-president of Shawinigan Products Corporation, vice-president and general manager of new company, and T. F. Wettstein, formerly of United Lead Co., vice-president, and continuing in charge of manufacture.

Biflex Products Corporation, Decatur, Ill., is erecting an addition, 150 x 160 ft., and is moving machinery and business of its bumper plant at Waukegan to local works. About $100,000 will be spent on new equipment.

Fisher Governor Co., Marshalltown, Iowa, has purchased Apex Regulator Co., Decatur, Ill. Apex products are closely allied with those of purchasing company, which manufactures automatic pressure control specialties for steam, water, air and oil and gas industries. Equipment of Apex company will be removed to Marshalltown, where Fisher Governor Co. will operate Apex company as a separate unit.

Indiana

INDIANAPOLIS, July 22.—E. L. Cord, president of Auburn Automobile Co., Auburn, and associates have organized Corman Aircraft Corporation, with capital of $50,000 and headquarters at Connersville. New company is said to be planning establishment of local factory, including departments for parts production and assembling. Mr. Cord and associates are now operating an experimental aircraft plant at Dayton, and it is understood that this will be consolidated with new company later. L. E. Manning and Raymond S. Pruditt are interested in new concern.

Board of Education, 150 North Meridian Street, Indianapolis, is said to be planning installation of manual training school in new three-story and basement junior high school to cost $600,000, for which bids are being asked on general contract until Aug. 1. McGuire & Shook, 941 North Meridian Street, are architects.

United States Corrugated Fibre Box Co., 1315 Martindale Avenue, Indianapolis, has asked bids on general contract for one and two-story and basement plant, to cost about $200,000 with machinery. Charles E. Bacon, Odd Fellows Building, is architect.

Glascock Brothers Mfg. Co., 1515 West Fifteenth Street, Muncie, manufacturer of bottle coolers, dispensers and similar equipment, has awarded general contract to G. W. Ewing & Son., 1919 West Eighth Street, for three one-story additions, to cost about $45,000 with equipment.

Kunkle Valve Co., Fort Wayne, has awarded general contract to Bueshing & Hagerman Co., 402 East Superior Street, for two-story service building, 60 x 150 ft., to cost about $40,000 with equipment.

L. S. Guetti Tool Co., 113 North New Jersey Street, Indianapolis, has been organized to manufacture special tools and gages. Company is in operation.

Cincinnati

CINCINNATI, July 22.—New machine tool business in this district is in good volume for this season of the year, and plants are maintaining capacity production to clean up unfilled orders. Inquiry, although for only one or two machines at a time, is sufficiently brisk to give promise of a steady volume of fresh bookings. Among new orders the past week were two from automobile manufacturers and one from a tool maker for medium sized planers. A French Commission, which has established headquarters at Cleveland, has requested information on automatic lathes for boring airplane engine cylinders.

Bids will soon be asked by Dayton Rubber Mfg. Co., West Riverview Avenue, Dayton, Ohio, for a two-story addition, to cost about $150,000 with equipment. Schenck & Williams, Third National Bank Building, are architects. J. A. McMillan is president.

Ovens, power equipment, conveying and other machinery will be installed by General Baking Corporation, 420 Lexington Avenue, New York, in extensions to plants at Columbus, Ohio, Louisville and Indianapolis, including improvements in present units. Expansion at Columbus plant will cost about $600,000, and at other two bakeries $350,000 each, for completion by close of year.

City Council, Nashville, Tenn., is arranging fund of $250,000 for extensions and improvements at McConnell airport, to be used as a municipal field, including new hangar units, repair and reconditioning shops, and other buildings.

City Council, Tippecanoe, Ohio, is said to be planning early call for bids for extensions and improvements in municipal electric light and power plant, including installation of additional equipment, to cost $100,000. Collins H. Wight, Dayton Savings & Trust Building, Dayton, Ohio, is engineer.

Knoxville Structural Steel Co., Knoxville, Tenn., recently organized by H. R. Adams, Knoxville, and associates, with capital of $100,000 has acquired property on Central Avenue as site for new steel fabricating plant, with main unit, 60 x 100 ft., to cost about $75,000 with equipment.

City Council, Kingsport, Tenn., is considering establishment of municipal airport on Reedy Creek, where site has been selected, to include hangar, repair shop, oil storage and other units, to cost more than $50,000.

Board of Education, Springfield, Ohio, is planning installation of manual training equipment in new junior high school to cost $250,000, for which bids are being asked on general contract until Aug. 2. Eastman & Budke, First National Bank Building, are architects.

City Council, Jackson, Tenn., is arranging bond issue of $750,000, for a municipal electric light and power plant,

to include either purchase of existing local central station with expansion program, or construction of new plant.

Wyatt C. Hedrick, Inc., First National Bank Building, Forth Worth, Tex., plans construction of six-story automobile service, repair and garage building at Memphis, Tenn., 148 x 150 ft., to cost more than $400,000 with equipment.

Milwaukee

MILWAUKEE, July 22.—Although inquiries are in large volume, there are signs of easier tendencies in the equipment markets, with relief in tension especially noticeable in machine tools. Prosperity among the machine manufacturers is inducing many to undertake expansions which indicate good fall and winter demand for equipment.

Glancy Malleable Iron Corporation, 840 Wisconsin Central Street, Waukesha, Wis., has begun work on a foundry addition, 118 x 208 ft., to be followed by another unit for shipping department. Plans are by A. A. Wickland & Co., consulting engineers, 205 West Wacker Drive, Chicago. Worden-Allen Co., Milwaukee, is general contractor.

Giddings & Lewis Machine Tool Co., Fond du Lac, Wis., is building an addition for assembling and erecting to cost $100,000, and will install 20-ton electric crane. Austin Co., Cleveland, Ohio, designers; Immel Construction Co., Fond du Lac, has general contract.

Wisconsin Valley Electric Co., Wausau, Wis., has started reconstruction of its hydroelectric power plant on Wisconsin River, near Tomahawk, Wis., at cost of $140,000.

City of West Allis, Wis., is taking bids until July 30 for furnishing and installing a 1,000,000-gal. elevated steel tank for water supply extension. William Darby is city engineer.

St. Louis

ST. LOUIS, July 22.—Contract has been let by Marquette Cement Mfg. Co., 401 Louderman Building, St. Louis, to Gamble Construction Co., 620 Chestnut Street, for storage and distributing plant to cost about $90,000 with equipment. L. E. Ritter, 140 South Dearborn Street, Chicago, is architect.

Mack International Motor Truck Corporation, 2804 Pine Street, St. Louis, manufacturer of motor trucks, with headquarters at 25 Broadway, New York, will soon take bids for a one-story service, repair and sales building, to cost $230,000 with equipment. H. E. Foster, 400 West Madison Street, Chicago, is architect.

City Council, Kansas City, Mo., is arranging fund of $500,000 for establishment of new municipal airport, consisting of hangars, repair shops and other units. Main structures will have total floor space of 160,000 sq. ft. City engineering department, City Hall, will be in charge.

Missouri Power & Light Co., Board of Trade Building, Kansas City, Mo., is planning extensions in power plant at Jefferson City, Mo., and installation of additional equipment. Work will be carried out in connection with new transmission line between Jefferson City and Mexico, Mo., with power switching stations and other structures, entire project to cost more than $300,000.

Seven-in-One Brake Co., 1430 Baltimore Avenue, Kansas City, Mo., automobile brakes and equipment, has leased one-story and basement building to be erected at 3222 Gillham Plaza, for new service and repair works, to cost about $40,000 with equipment. Hoit, Price & Barnes, Telephone Building, are architects.

International Agricultural Corporation, 61 Broadway, New York, has purchased 20-acre tract in College Hill section, Texarkana, Ark., as site for new one-story plant 140 x 300 ft., to manufacture commercial fertilizers to cost about $140,000 with machinery.

American Eagle Aircraft Corporation, Kansas City, Mo., manufacturer of airplanes and parts, has purchased Wallace Aircraft Co., Chicago, manufacturer of a special three-piece folding wing monoplane, and will consolidate. Chicago plant, which has capacity for about one complete plane unit per week, will be removed to Kansas City, where increased production will be developed. With this acquisition, purchasing company will produce seven different types of aircraft. E. E. Porterfield, Jr., is president.

Charles F. Haller, Parsons, Kan., is at head of project to construct a new plant to manufacture aluminum products. Negotiations are under way with Chamber of Commerce. Fulton, Mo., for suitable site.

Midwest Stove & Enameling Co., 1100 South Charles Street, Belleville, Ill., has leased 5,000 sq. ft. of floor space from C. Heinz Stove Co., Second and Chestnut Streets, St. Louis, for manufacture of sheet iron heaters.

Cleveland

CLEVELAND, July 22.—Contract has been let by Reliance Electric & Engineering Co., 1088 Ivanhoe Road, Cleveland, manufacturer of electric motors, generators, etc., to J. L. Hunting Co., Guarantee Title Building, for one-story addition, 150 x 175 ft., to cost about $115,000 with equipment.

Patterson Foundry & Machine Co., East Liverpool, Ohio, manufacturer of pottery machinery, etc., has awarded a general contract to Potters' Lumber Co., East Liverpool, and Hiner Structural Steel Co., Canton, Ohio, for one-story machine shop, to cost $135,000 with equipment.

Electric Auto-Lite Co., Toledo, Ohio, manufacturer of automobile starting and lighting equipment, etc., has purchased John W. Brown Mfg. Co., Martin Road, Columbus, Ohio, manufacturer of automobile lamps, headlights and kindred products, and will consolidate. Expansion in output is planned.

White Motor Co., East Seventieth Street and St. Clair Avenue, Cleveland, manufacturer of motor trucks, has plans for one-story service, repair and sales building, to cost $200,000 including equipment. Hadlow, Hughes, Hick & Conrad, 819 Euclid Avenue, are architects.

Ford Motor Co., Detroit, has awarded general contract to Krebay Construction Co., New City Trust Building, Indianapolis, for extensions and improvements in branch assembling plant at Cleveland, to cost $200,000 with equipment.

Mohawk Rubber Co., Akron, Ohio, has asked bids on general contract for a three-story and basement addition, 75 x 100 ft., to cost about $135,000 with equipment. Henry & Murphy, Second National Bank Building, are architects.

Logan Gear Co., Toledo, Ohio, and Bingham Stamping Co., with local plant for manufacture of sheet metal stampings, have arranged for a consolidation. New company will have a capital of 190,000 shares of stock, no par value, with assets totaling $2,000,000. Expansion in output is planned.

Gulf States

BIRMINGHAM, July 22.—Plans are in progress by Brown Paper Mill Co., Monroe, La., for additions to mill at West Monroe to double present capacity, and to cost more than $4,000,000. George F. Hardy, 309 Broadway, New York, is consulting engineer.

Phillips Petroleum Co., Bartlesville, Okla., has authorized enlargements in oil refinery at Borger, Tex., to cost more than $100,000 with machinery.

Dallas Power & Light Co., Dallas Tex., has work under way on addition to steam-operated electric generating plant, making a total output of 100,000 hp., for station. Extensions will be made in transmission lines and power switching facilities. Entire project will cost about $3,000,000 and is scheduled for completion by end of year.

City Council, Beaumont, Tex., has plans for establishment of municipal airport, including steel hangars, oil storage and distributing building, repair and reconditioning shops, to cost more than $65,000 wth equipment. R. C. Black, city engineer, in charge.

Linde Air Products Co., 30 East Forty-second Street, New York, manufacturer of commercial oxygen, welding apparatus, etc., has awarded contract to J. M. Brown, Shreveport, La., for one-story and basement plant at Agurs, to cost $50,000 with equipment.

International Lubricant Corporation, Canal Bank Building, New Orleans, has plans for new two-story plan, 60 x 100 ft., to manufacture lubricating specialties, to cost about $30,000 with equipment.

T. A. T. Flying Service, Inc., Fort Worth, Tex., a subsidiary of Southern Air Transport, Inc., same address, has purchased 380-acre tract near Wichita Highway, about six miles from city, for establishment of commercial airport, including steel hangars, repair shops, and other mechanical units, to cost about $200,000 with field development. T. A. T. Flying School, Inc., will establish buildings and headquarters at new location, while another subsidiary, Southern Aeromotive Service, Inc., will construct main repair and service works there for concentration of operations.

Board of Education, Greenville, Miss., is considering installation of manual training equipment in two and one-half story junior high school to cost $220,000, for which bids will soon be asked on general contract. N. W. Overstreet, Mississippi Fire Insurance Building, Jackson, is architect.

East Bank Water District No. 1, Jefferson Park, Kenner, La., plans early call for bids for steel water tank and elevated steel tower, pumping machinery, and auxiliary equipment for waterworks project to cost $1,250,000. Bond issue in amount noted has been voted. Henry A. Mentz & Co., Hammond, La., are engineers.

Texas Air Transport Flying Service, Inc., Fort Worth National Bank Building, Fort Worth, Tex., is planning hangar, with machine and repair shop at municipal airport at El Paso, Tex., to cost about $50,000 with equipment.

Pacific Coast

SAN FRANCISCO, July 18.—Miller Schofield, Inc., Los Angeles, recently organized with capital of $5,000,000 by officials of Harry Miller Mfg. Co., and Schofield, Inc., both of same city, to manufacture engines for motor boats, airplanes and automobiles, is said to be completing plans for establishment of local plant, to cost more than $200,000 with equipment.

Boeing Air Transport Co., Inc., Balboa Building, San Francisco, with headquarters at Seattle, has awarded general contract to Austin Co. of California, San Francisco, for aircraft manufacturing plant on 10-acre tract near municipal airport at Oakland, Cal., to cost more than $300,000 with equipment. Company also has another plant in progress at Los Angeles, to cost about $400,000 with machinery.

Angelus Oil Tool Corporation, Los Angeles, has plans for one-story plant, 35 x 115 ft., to manufacture oil well drilling tools and equipment, to cost about $25,000 with equipment. Lawrence Nowell, 4814 Loma Vista Street, is architect.

Mine & Smelter Supply Co., Salt Lake City, Utah, has purchased local property as site for new three-story storage and distributing plant, with heavy hardware and machinery departments, to cost $130,000 with equipment. Main plant is at Denver.

Marchant Calculating Machine Co., Emeryville, Cal., manufacturer of computing machines and parts, has plans for a one and two-story addition, to cost $60,000 with equipment. Miller & Warnecke, 1404 Franklin Street, Oakland, Cal., are architects.

Phoenix Aircraft Corporation, Phoenix, Ariz., Floyd Stahl, secretary, in charge, has plans for airplane manufacturing plant, one story, with departments for parts production and assembling, to cost about $65,000 with equipment.

Southern Pacific Co., 500 South Central Avenue, Los Angeles, has plans for new locomotive and car repair shops on San Fernando Road, consisting of engine house, $140,000; one-story machine shop, 74 x 225 ft., $100,000; power house, 50 x 55 ft., and other buildings, to cost $275,000 with equipment.

Pacific Coast Pulp & Paper Co., Richvale, Cal., has awarded general contract to Charles S. Mabrey Co., Inc., Fourth and J Streets, Sacramento, Cal., for new units, comprising machine room, 60 x 225 ft.; two-story beater room, 75 x 120 ft.; boiler plant, 50 x 90 ft., and other structures, to cost $400,000 with machinery.

Axelson Airplane Engine Co., recently formed as a subsidiary by Axelson Machine Co., 6160 South Boyle Avenue, Los Angeles, has awarded general contract to Consolidated Steel Corporation, Los Angeles, for new one-story plant, 120 x 220 ft., at Huntington Park, for parts production and assembling, to cost $90,000 with equipment.

Archer Blower & Pipe Co., 641 East Sixty-first Street, Los Angeles, Cal., has been incorporated to succeed Archer Blower & Pipe Co. Company will manufacture blowers, piping systems and inhibitors, chiefly for industrial plants. Jules F. Archer is president.

Claggett Overhead Irrigation & Lawn Sprinkler Co. has been organized as subsidiary of Claggett Pipe & Supply Co., 2834 Sunset Boulevard, Los Angeles, Cal. Former company will manufacture general sprinkler equipment, pipe and irrigation supplies. Walter Meek is manager.

Southern California Gas Co., Los Angeles, has applied for permission to construct and operate a natural gas pipe line from Kettleman Hills section to points in San Joaquin Valley, totaling about 150 miles, with booster stations, etc., to cost $1,400,000. It is also proposed to build a line for similar service from Huntington Beach to La Jolla, to cost more than $250,000.

City Council, Mount Pleasant, Utah, is planning construction of municipal electric light and power plant, to cost $40,000 with equipment. A bond issue will be voted.

Foreign

OFFICIALS of Torrington Co., Torrington, Conn., manufacturer of metal specialties, swaging machinery, bicycle parts, etc., have organized a subsidiary to operate in Great Britain, under name of Torrington Co., Ltd., capitalized at £5000 (about $25,000), and is said to be planning establishment of plant facilities.

General Electric Co., Schenectady, N. Y., is said to be planning construction of new plant at Monterrey, State of Neuvo Leon, Mexico, for manufacture of electric lamps, to cost more than $500,000 with equipment.

Berlin Electric Co., Berlin, Germany, has arranged for loan of $3,000,000 in United States, considerable part of proceeds to be used for expansion.

Chinese Nationalist Government, Peking, through National Council of Reconstruction in China, has authorized construction of two radio broadcasting stations, and equipment will be purchased in United States, including steel towers, power station apparatus and broadcasting equipment for short-wave operation.

Municipalities and Local Commissions Section, Ministry of the Interior, Cairo, Egypt, is asking bids until Aug. 13 for an electric power plant, including equipment, with underground and overhead transmission and distributing lines for town of Maghagha in Minieh Province.

American Smelting & Refining Co., 120 Broadway, New York, has expansion program under way at plant in northern Peru, to include installation of sintering machines and auxiliary equipment to cost over $750,000. Work is scheduled for completion late in fall.

N. I. Stamatiu, Bulevardul Basarab 17, Bucharest, Roumania, desires to receive drawings and descriptions, together with prices in lei, of snow plows of American type for use on Roumanian railroads. Price is to be named c.i.f. Port Roumain, Braila, Galatzi or Constanta. Tenders are to be addressed to N. I. Stamatiu for transmission to "Administration Generale des Chemins de Fer de Roumanie."

Aeronautics Bureau, Government of Japan, Tokyo, is arranging an appropriation of 3,845,292 yen ($1,768,834) to be expended for new civil airports at Tokyo, Fukuoka and Tsushima, along line of new international airway from Tokyo to Seoul in Korea, during 1929, '30 and '31, including hangars, repair and reconditioning shops and other mechanical buildings.

Fabrica Nacional de Automoviles, S. A., Barcelona, Spain, recently organized with capital of 16,000,000 pesetas to manufacture automobiles, is planning construction of plant near city noted, where headquarters will be maintained, including parts manufacture and assembling. Branch plants and service branches will also be established in different parts of country.

Canada

TORONTO, July 22.—The machine tool market in this territory is beginning to show more life. Inquiries, while mostly for single tools, are improving and a few lists are appearing for a half dozen tools. Some good purchases have been made the past week for plants under construction. Mining development work has stimulated demand for equipment in Ontario, Quebec, Manitoba and Saskatchewan, and some good-sized orders are expected within the next few weeks. Small tools are moving freely.

City of Edmundston, N. B., will start work soon on construction of a power house and dam which, with equipment, will represent an expenditure of $200,000. Thomas Gwerette is clerk. H. G. Acres & Co., Ltd., Ferry Street, Niagara Falls, Ont., is consulting engineer.

Several contracts have been awarded for a $500,000 foundry at St. Laurent, Que., for Robert Mitchell Co., Ltd., 750 Belair Street. Anglin-Norcross, Ltd., is general contractor.

Hull Iron & Steel Foundries, Ltd., Montcalm Street, Hull, Que., has awarded general contract to Gordon Black, Leaside Avenue, for an addition to cost $200,000.

Hamilton Boiler Works, 925 King Street West, Hamilton, Ont., will build a one-story factory to cost $20,000.

Ontario Refinery Co., in which Consolidated Mining & Smelting Co., and International Nickel Co. are interested, has awarded the general contract to Fraser Brace, Ltd., 107 Craig Street, Montreal, for a copper refinery at Copper Cliff, Ont., to include an electrolytic tank house, 300 x 400 ft., and two casting buildings, each 200 x 300 ft.

Southern Canada Power Co., will start work immediately on a 2000-hp. electric development plant at Burroughs Falls, near Drummondville, Que.

Fairchild Aircraft, Ltd., recently incorporated with a capital stock of $2,000,000, has purchased 265 acres near Montreal, and will establish an airport, build hangars and erect a plant to manufacture airplanes.

Skinner Co., Ltd., Oshawa, Ont., has plans for an automobile bumper manufacturing plant.

New Trade Publications

Refractories for Power Plants.—Charles Taylor Sons Co., Cincinnati. An eight-page booklet, contains information of a technical and practical nature in regard to fireclay brick for boiler settings. After discussing refractoriness, shrinkage, slag erosion, spalling, joints and chemical analysis, the booklet describes Taylor-made fire brick.

Manganese Steel.—American Manganese Steel Co., Chicago Heights, Ill. An eight-page pamphlet illustrating and describing new applications and unusual uses for manganese steel, for Fahralloy, and Amsco products.

Heat Treatment of Gray Iron.—Whiting Corporation, Harvey, Ill. An eight-page pamphlet entitled, "Heat Treatment of Gray Cast Iron" is a reprint of an article by Dr. Edward E. Marbaker, director of foundry research department of the Whiting Corporation, published in the interest of the foundry industry by that company. It is a reprint of an article in THE IRON AGE of Aug. 2, 1928.